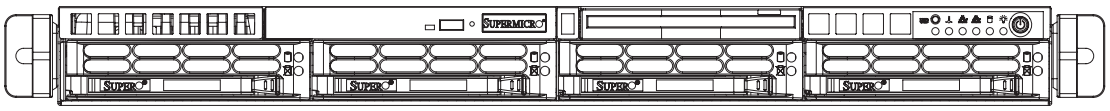
SUPERMICRO®

SUPERSERVER 6014P-T
SUPERSERVER 6014P-TR



USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6014P-T/6014P-TR. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 6014P-T/6014P-TR is a high-end server based on the SC814+T-560/SC814+T-R560 1U rackmount chassis and the Super X6DHP-TG, a dual processor serverboard that supports Intel® 64-bit Xeon™ processors at a Front Side (System) Bus speed of 800 MHz and up to 12/24 GB of registered ECC DDR333/266 SDRAM.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X6DHP-TG serverboard and the SC814+T-560/SC814+T-R560 chassis, which comprise the SuperServer 6014P-T/6014P-TR.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6014P-T/6014P-TR into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6014P-T/6014P-TR.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X6DHP-TG serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC814+T-560/SC814+T-R560 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply modules and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Codes

Appendix B: Software Installation

Appendix C: System Specifications

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Chapter 1

Introduction

1-1 Overview

The SuperServer 6014P-T/6014P-TR is a high-end server comprised of two main subsystems: the SC814+T-560/SC814+T-R560 1U server chassis and the X6DHP-TG dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 6014P-T/6014P-TR (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 6014P-T/6014P-TR, as listed below:

- One (1) slim floppy drive [FPD-TEAC-S(B)]
- One (1) slim 8x DVD/24x CD-ROM drive [DVM-PNSC-824(B)]
- Five (5) sets of 40-mm counter-rotating fans (FAN-0079)
- One (1) front control panel cable
- One (1) rackmount kit (CSE-PT51)
- One (1) rear COM port kit
- Riser Cards: (see section 5-6 for details)
  6014P-T: One (1) riser card (CSE-RR1U-XR) for PCI-X add-on card
  One (1) riser card (CSE-RR1U-X) for PCI-X add-on card
  One (1) riser card (CSE-RR1U-ER) for PCI-E add-on card
  One (1) riser card (CSE-RR1U-EL) for PCI-E add-on card
  6014P-TR: One (1) riser card (CSE-RR1U-XR) for PCI-X add-on card
  One (1) riser card (CSE-RR1U-ER) for PCI-E add-on card
- Serial ATA Accessories
  One (1) Serial ATA backplane (CSE-SAS-814)
  One (1) SATA 4-lane cable (CBL-0090)
  Four (4) SATA drive carriers [CSE-PT39(B)]
- One (1) CD containing drivers and utilities

- SuperServer 6014P-T/6014P-TR User's Manual

1-2 Serverboard Features

At the heart of the SuperServer 6014P-T/6014P-TR lies the X6DHP-TG, a dual processor serverboard based on Intel's E7520 chipset. Below are the main features of the X6DHP-TG (see Figure 1-1 for a block diagram of the chipset).

Processors

The X6DHP-TG supports single or dual 604-pin Intel Xeon EM64T type processors at a FSB speed of 800 MHz. Please refer to the serverboard description pages on our web site for a complete listing of supported processors.

Memory

The X6DHP-TG has six 184-pin DIMM sockets that can support up to 12 GB of registered ECC DDR333 (PC2700) or up to 24 GB of registered ECC DDR266 (PC2100) SDRAM. The memory is an interleaved configuration, which requires modules of the same size and speed to be installed in pairs. Please refer to Chapter 5 for memory speed jumper settings.

Serial ATA

A Marvell SATA controller is integrated into the X6DHP-TG to provide a four-port Serial ATA subsystem, which is RAID 0 and 1 supported. The ICH5R South Bridge of the chipset also includes a Serial ATA controller that supports two SATA ports (RAID 0, 1 and JBOD supported). The SATA drives are hot-swappable units.

Notes: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives. The system supports Zero Channel RAID (ZCR) with an Adaptec 2020SA card (not included) in the JPCIX1 slot (RAID levels 0, 1, 5 and 10 supported).

Onboard Controllers/Ports

One floppy drive controller and two onboard ATA/100 controllers are provided to support up to four IDE hard drives or ATAPI devices. The color-coded I/O ports include one COM port*, a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports.
*The backpanel COM port is available with the use of the rear COM port kit (included with system). COM1 and COM2 are both headers on the X6DHP-TG.

ATI Graphics Controller

The X6DHP-TG features an integrated ATI video controller based on the Rage XL graphics chip. Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Server Chassis Features

The SuperServer 6014P-T/6014P-TR is a high-end, scaleable server platform built upon the SC814+T-560/SC814+T-R560 1U server chassis. The following is a general outline of the main features of the SC814T-560/SC814T-R560 chassis.

System Power

6014P-T: the SC814+T-560 features a single 560W cold-swap power supply. Power must be removed from the system before servicing or replacing the power supply.

6014P-TR: the SC814+T-R560 features a redundant 560W hot-swap power supply that consists of two power modules. One power supply module will take over if the other fails. The hot-swap capability allows you to replace a failed power supply module without having to power down the system.

Serial ATA Subsystem

The SC814+T-560/SC814+T-R560 chassis was designed to support four Serial ATA hard drives, which are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives.

PCI Expansion Slots

6014P-T: supports the use of two standard size PCI-X add-on cards (of up to 100 MHz) or two standard size PCI-Express x8 add-on cards (with riser cards). See section 5-6 for details.

6014P-TR: supports the use of one standard size 100 MHz PCI-X or PCI-Express x8 add-on card (with riser card). See section 5-6 for details.

Front Control Panel

The SC814+T-560/SC814+T-R560's control panel provides you with system monitoring and control. LEDs indicate UID, system power, HDD activity, network activity (2) and overheat/fan failure. A main power button and a UID button are also included. See page 5-21 for details on the UID (Unit Identifier).

I/O Backplane

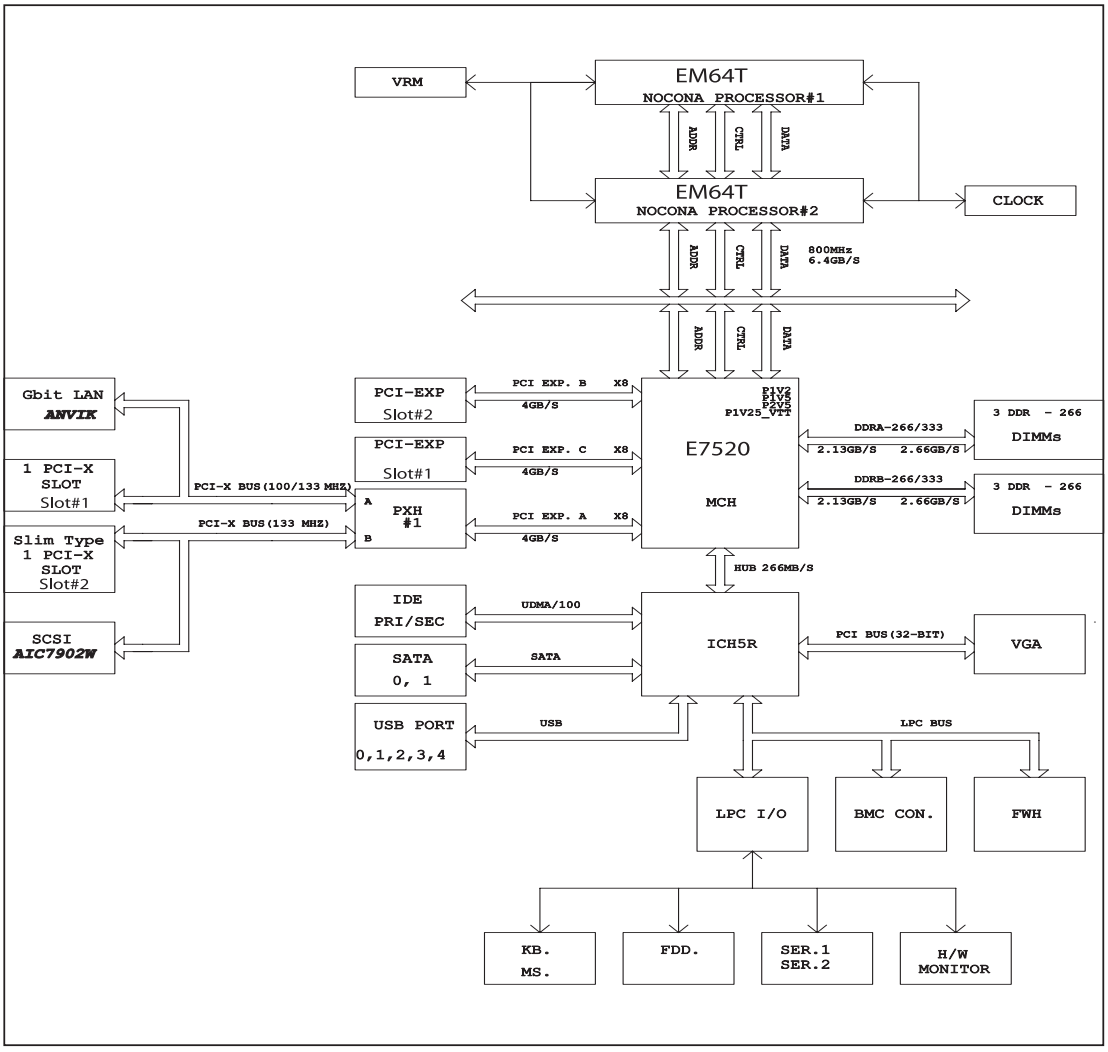
The SC814+T-560/SC814+T-R560 is an ATX form factor chassis that is designed to be used in a 1U rackmount configuration. Ports on the I/O backplane include one COM port, a VGA port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two gigabit Ethernet ports. A UID button/LED is also included on the server backplane.

Cooling System

The SC814+T-560/SC814+T-R560 chassis has an innovative cooling design that features five sets of 40-mm counter-rotating fans located in the middle section of the chassis. There is a "Fan Speed Control Mode" setting in BIOS (page 7-16) that allows chassis fan speed to be determined by system temperature [recommended setting is "3-pin (Server)]. The power supply module(s) also includes a cooling fan.

Figure 1-1. Intel E7520 Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



1-4 Contacting Supermicro

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Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6014P-T/6014P-TR up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 6014P-T/6014P-TR was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the 6014P-T/6014P-TR. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 6014P-T/6014P-TR was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the 6014P-T/6014P-TR into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

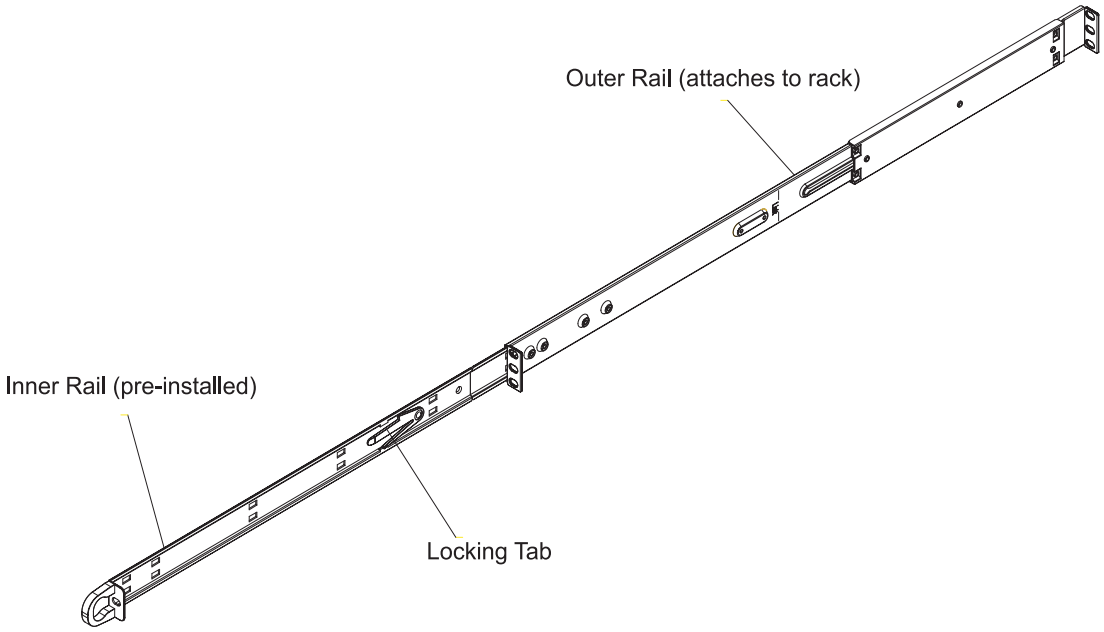
Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself (see Figure 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step. A

Figure 2-1. Identifying the Sections of the Rack Rails (right side rail shown)



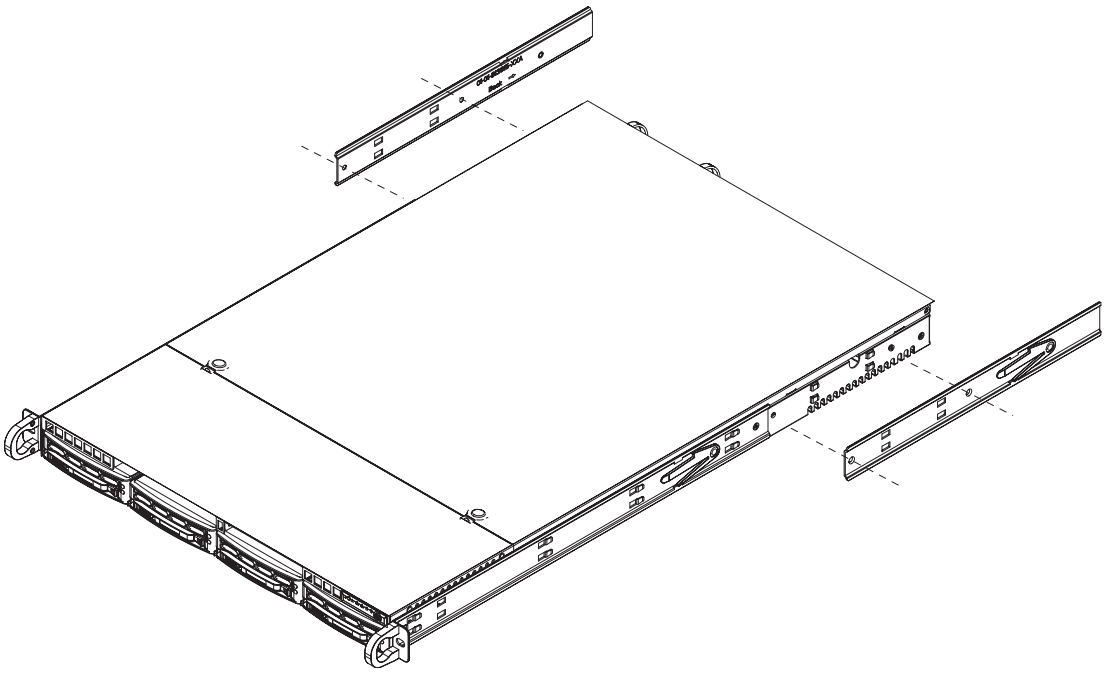
Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two M4 screws and the long bracket to the rear side of the outer rail with three M4 screws. Repeat these steps for the left outer rail.

Locking Tabs

Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing the Rack Rails

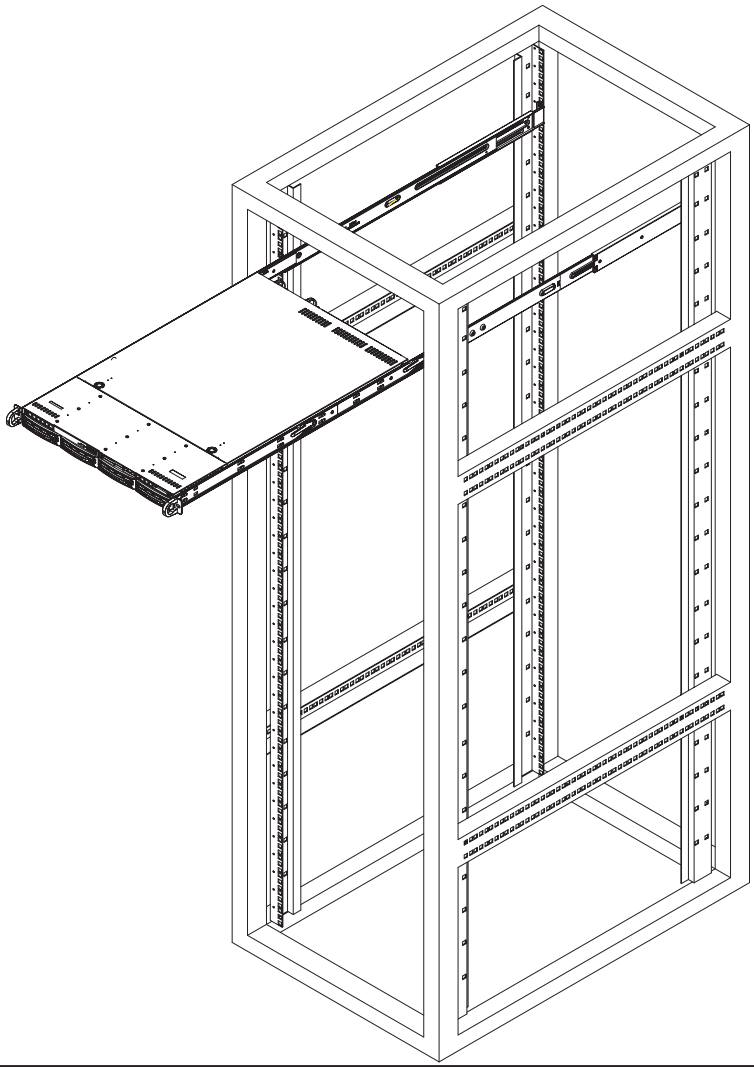


Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

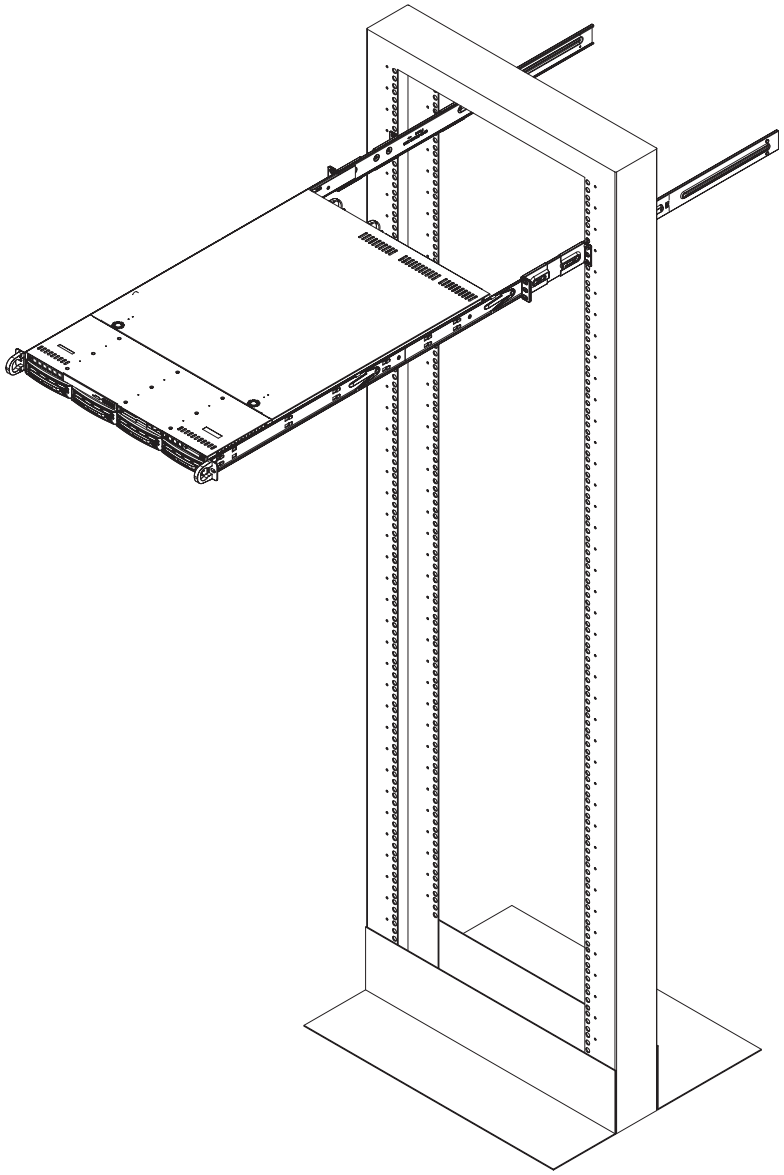
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

If you are installing the SuperServer 6014P-T/6014P-TR into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Serverboard Setup

After you install the 6014P-T/6014P-TR in the rack, you will need to open the top cover to make sure the serverboard is properly installed and all the connections have been made.

1. Accessing the inside of the System (see Figure 2-5)

First, release the retention screws that secure the system to the rack. Grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover (1). Push the cover away from you (toward the rear of the chassis) until it stops (2). You can then lift the top cover from the chassis to gain full access to the inside of the server.

To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

2. Check the CPUs (processors)

You should have one or two processors already installed in the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

3. Check the system memory

Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards

If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

5. Check all cable connections and airflow

Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

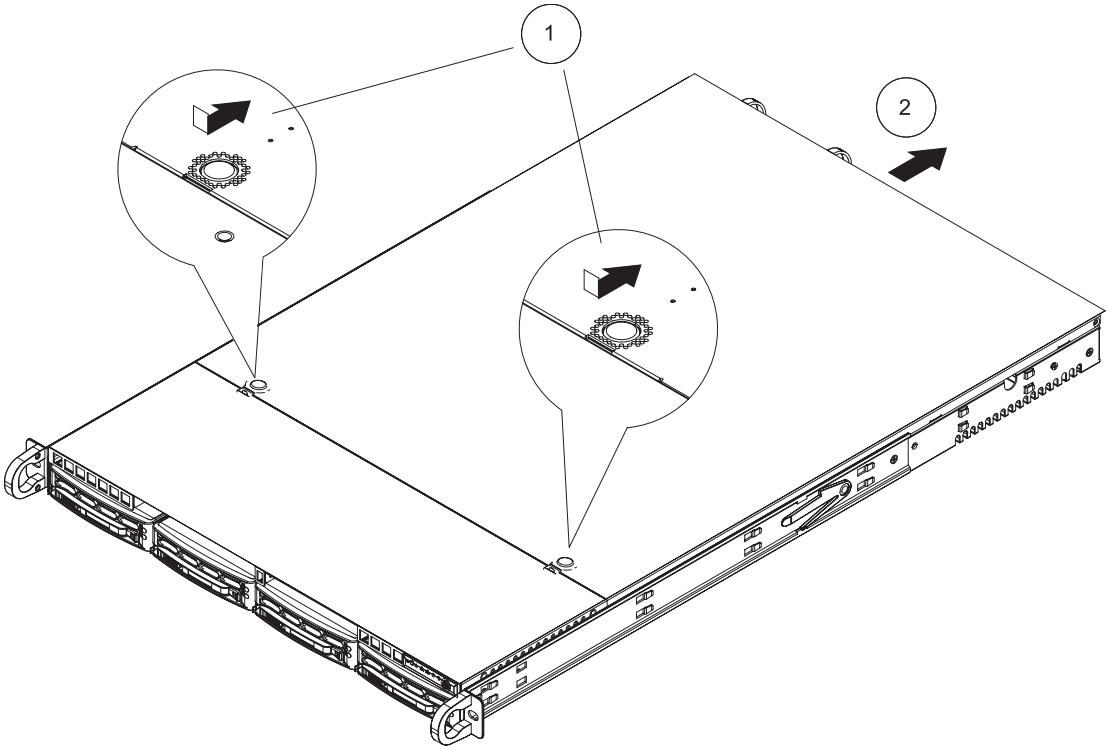


Figure 2-5. Accessing the Inside of the System

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the Serial ATA drives and SATA backplane have been properly installed and all connections have been made.

1. **Accessing the drive bays**
   All drives are accessable from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. **CD-ROM and floppy disk drives**
   A slim CD-ROM and floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. **Check the Serial ATA disk drives**
   Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SATA drives, please refer to Chapter 6.

4. **Check the airflow**
   Airflow is provided by five sets of 40-mm fans (each set of fans consists of two fans that are mounted back to back). The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

5. **Supplying power to the system**
   The last thing you must do is to provide input power to the system. Plug the power cord(s) from the power supply module(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS) source.

Chapter 3

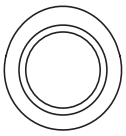
System Interface

3-1 Overview

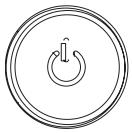
There are several LEDs on the chassis control panel as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-button buttons located on the front of the chassis. These are (in order from left to right) a UID button and a power on/off button.



- **UID:** Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations (see page 5-21). The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.



- **POWER:** This is the main power switch, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC814+T-560/SC814+T-R560 chassis has six LEDs, which provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **UID:** This LED turns on when either the front or the rear UID button is pushed. Pushing either button a second time will turn this LED off.

- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.

- **NIC2:** Indicates network activity on GLAN2 when flashing.

- **NIC1:** Indicates network activity on GLAN1 when flashing.

- **HDD:** Indicates hard drive activity. On the SuperServer 6014P-T/6014P-TR this light indicates SATA and/or DVD-ROM drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply module(s). With the 6014P-T, this LED should always be green when the system is operating. On the 6014P-TR, this LED turns amber in the event of a power supply failure or if a power supply cord is disconnected or loose.

3-4 Serial ATA Drive Carrier LED

Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the Serial ATA drive carrier) indicates drive activity. A connection to the Serial ATA backplane enables this LED to blink on and off when that particular drive is being accessed.

Note: The second LED on the SATA carriers is not used.

Notes

Chapter 4

System Safety

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 6014P-T/6014P-TR from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives (not necessary for SATA drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply modules in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. See Figure 4-1.

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 6014P-T/6014P-TR clean and free of clutter.

- The SuperServer 6014P-T/6014P-TR weighs approximately 42/45 lbs (19.1/20.5 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

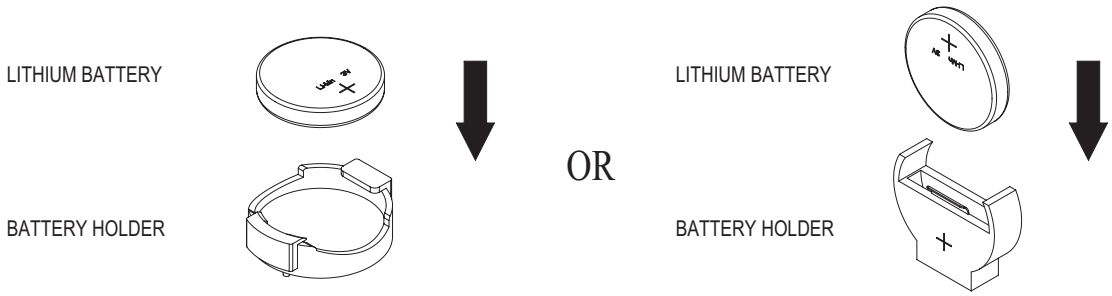
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 6014P-T/6014P-TR/ is operating to ensure proper cooling. Out of warranty damage to the 6014P-T/6014P-TR system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors, memory and heatsinks to the X6DHP-TG serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system.

5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

5-2 Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

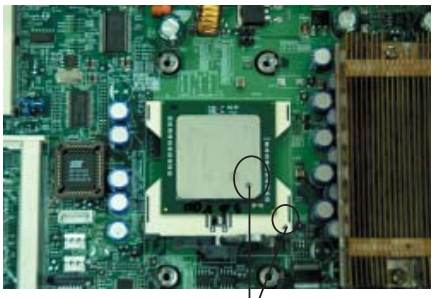
IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heat sink.

CPU Installation

1. Lift the lever on the CPU socket: Lift the lever completely as shown on the picture on the right; otherwise, you will damage the CPU socket when power is applied. Install CPU1 first.

Socket lever

2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1. (Socket #2 is automatically disabled if only one CPU is used.)



Pin 1

3. Press the lever down until you hear a *click*, which means the CPU is securely installed in the CPU socket. Repeat these steps if you wish to install a second CPU in socket#2.

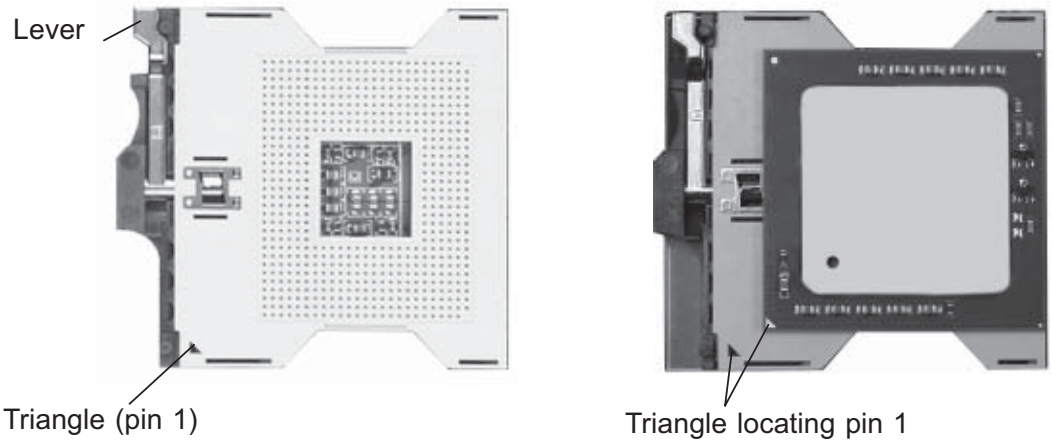
Socket lever in the locked position

Figure 5-1. 604-pin PGA Socket: Empty and with Processor Installed

Warning! Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Empty socket

With processor installed



Heatsink Installation

1. Do not apply any thermal compound to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Screw in two diagonal screws until snug (do not fully tighten the screws to avoid possible damage to the CPU). Then screw in the other two diagonal screws until snug. See Figure 5-2.

4. Finish the installation by fully tightening all four screws.

*The heatsink (SNK-P0009) is an optional item that is sold separately.

Removing the Heatsink/CPU

IMPORTANT: Removal of the heatsink or the CPU is not recommended. However, if you do need to remove the heatsink, please follow the instructions below to prevent damaging the CPU or the CPU socket.

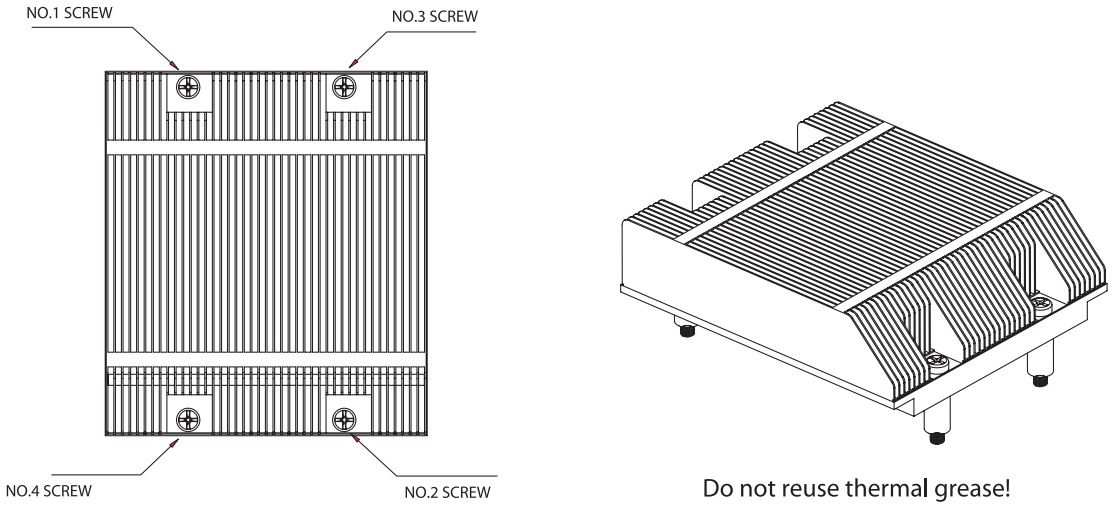
1. Unscrew and remove the heatsink screws from the serverboard in the sequence used when installing (diagonal screws).

2. Grasp the heatsink and gently wriggle it to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the heatsink has been loosened from the CPU, remove the heatsink from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install the heatsink to the CPU.

Figure 5-2. Installing the Heatsink



5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables. The following data cables (with their motherboard connector locations noted) should be connected. See the serverboard layout figure in this chapter for connector locations.

- Serial ATA cables (MSATA0-1)
- CD-ROM cable (JIDE2)
- Floppy drive cable (JFDD1)
- Control panel cable (JF1, see next page)
- COM port cable (COM1)

Connecting Power Cables

The X6DHP-TG has a 24-pin primary ATX power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to the JPWR1 connector to supply power to the serverboard. The 12V 8-pin power connector at JPWR2 must also be connected to your power supply. See the Connector Definitions section in this chapter for power connector pin definitions.

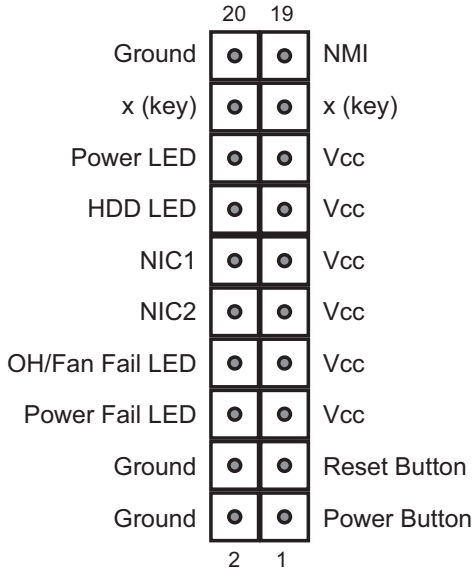
Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-3 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single ribbon cable to simplify their connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

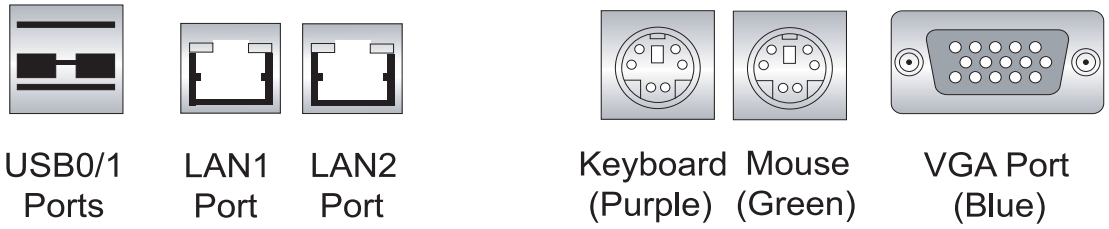
Figure 5-3. JF1 Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-4 below for the colors and locations of the various I/O ports.

Figure 5-4. I/O Ports



5-5 Installing Memory

Note: Check the Supermicro web site for recommended memory modules: http://www.supermicro.com/support/resources/

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (Figures 5-5a and 5-5b)

1. Insert the desired number of DIMMs into the memory sockets, starting with Bank #1A. The memory scheme is interleaved so you must install two modules at a time, beginning with DIMM #1A, then DIMM #1B, and so on.
2. Insert each DIMM module vertically into its socket. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the sockets. Repeat for all modules (see step 1 above).

Memory Support

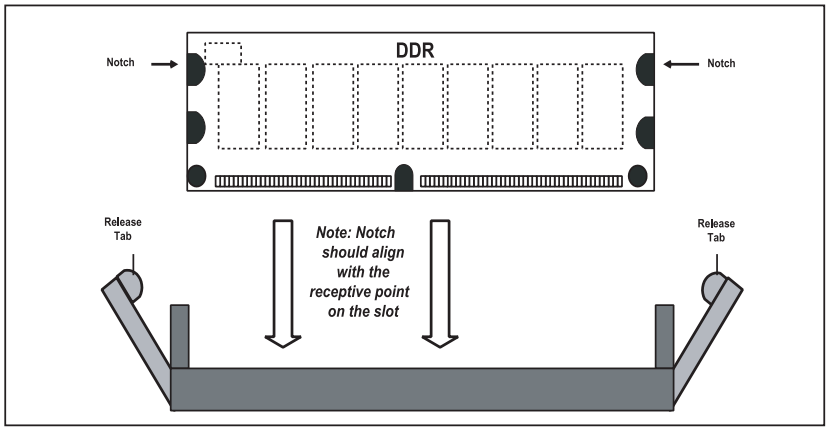
The X6DHP-TG has six 184-pin DIMM slots that can support up to 12 GB of registered ECC DDR333 (PC2700) or up to 24 GB of registered ECC DDR266 (PC2100)

SDRAM. The serverboard was designed to support 2 GB modules in each socket, but has only been verified for up to 1 GB modules. The memory is an interleaved configuration, which requires modules of the same size and speed to be installed in pairs. You should not mix modules of different sizes and/or speeds.

Memory Speed Jumpers

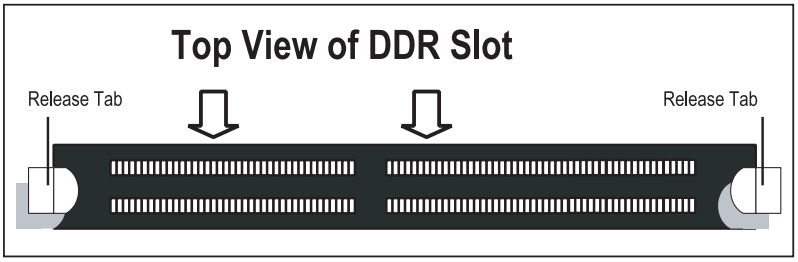
Depending on what type of memory you use, you may need to change the XJ4F1 and XJ4F2 (Memory Speed Select) jumpers. See pages 5-10, 5-11 and 5-20 for details.

Figure 5-5a. Side View of DIMM Installation into Slot



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Figure 5-5b. Top View of DIMM Slot



5-6 Adding PCI Cards

1. PCI slots

Your system should come with one or two riser cards to acommodate the use of one or two PCI expansion cards. The number and type of cards supported by each server system is shown below.

6014P-T: supports the use of one (each) standard size (full-height full-length) 100 MHz PCI-X add-on cards *or* two PCI-Express x8 add-on cards or a combination thereof.

6014P-TR: supports the use of one standard size (full-height full-length) 100 MHz PCI-X *or* one PCI-Express x8 add-on card.

6014P-T Riser Cards	**Slot** ⇨	**Add-on Card**
CSE-RR1U-XR (installed)	PCI-X (R) ⇨	PCI-X (100 MHz)
CSE-RR1U-X (installed)	PCI-X (L) ⇨	PCI-X (100 MHz)
CSE-RR1U-ER (boxed)	Univ. PCI (R) ⇨	PCI-Express x8
CSE-RR1U-EL (boxed)	Univ. PCI (L) ⇨	PCI-Express x8

6014P-TR Riser Cards	**Slot** ⇨	**Add-on Card**
CSE-RR1U-XR (installed)	PCI-X (R) ⇨	PCI-X (100 MHz)
CSE-RR1U-ER (boxed)	Univ. PCI (R) ⇨	PCI-Express x8

Notes: (L) refers to left and (R) refers to right-side slots when viewed from the front of the chassis. "Boxed" riser cards are included with the system (in the accessory box). A PCI-X slot and a PCI-E slot together constitute a Universal PCI slot. If both riser cards are to be used on the 6014P-T, you must install the right-side riser card (when viewed from front of the system) first.

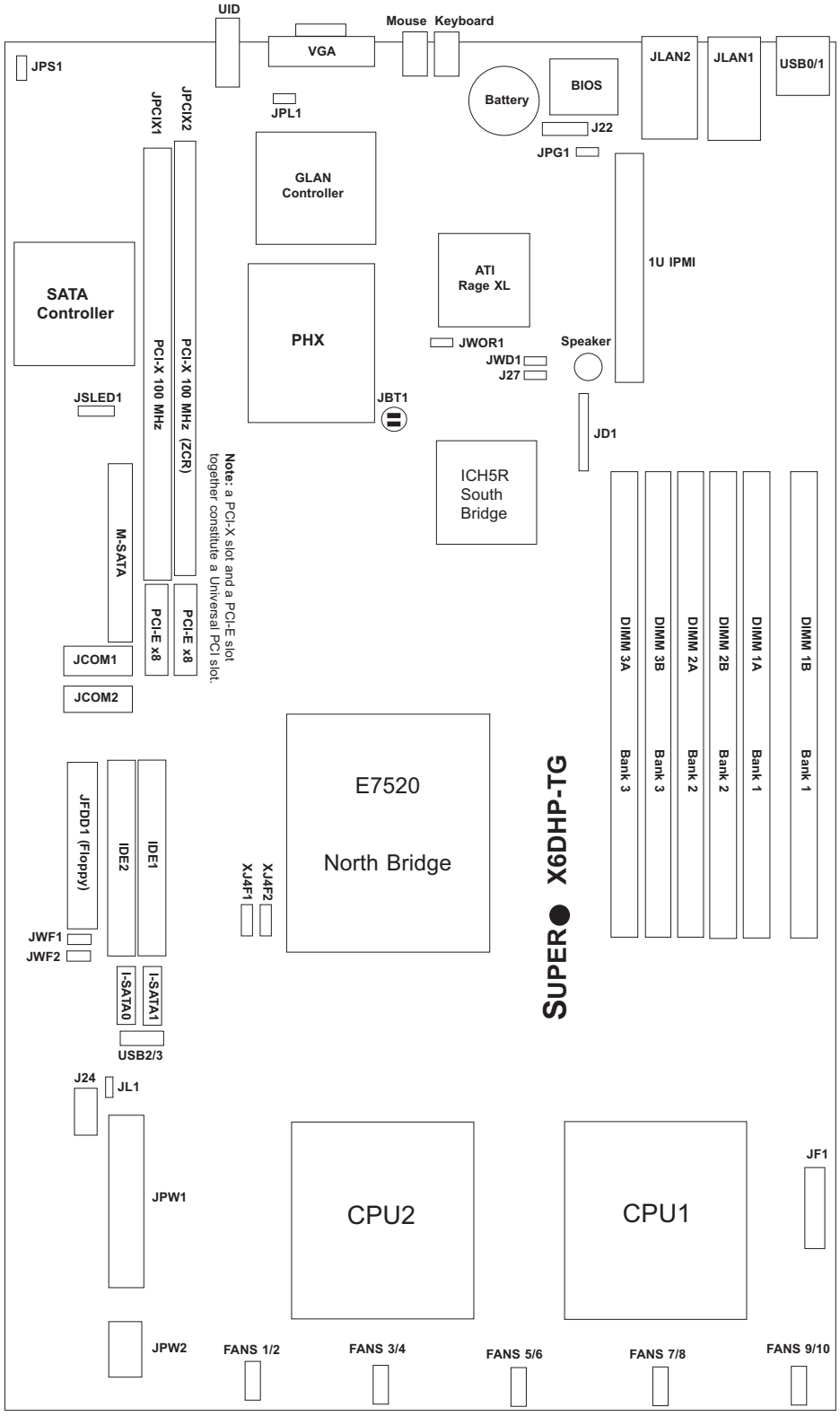
2. PCI card installation

Before installing a PCI add-on card, make sure you install it into the riser card and slot that supports the speed of the card (see step 1 above - you may need to change the installed riser card with a boxed one to support the type of add-on card you wish to install).

Begin by swinging out the release tab on the PCI slot shield that corresponds to the riser slot you wish to populate. Insert the PCI card into the correct riser slot, pushing down with your thumbs evenly on both sides of the card. Finish by pushing the release tab back to its original (locked) position. Follow this procedure when adding a card to the other slot (if applicable).

5-7 Serverboard Details

Figure 5-6. SUPER X6DHP-TG Layout
(not drawn to scale)



Notes:

Jumpers not noted are for test purposes only.

X6DHP-TG Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Section 5-9
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	JLAN Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)
JPS1	SATA Enable/Disable	Pins 1-2 (Enabled)
XJ4F1/XJ4F2	Memory Speed Select	Closed (DDR333)

Connector	Description
DIMM#1A-DIMM#3B	DDR DIMM Memory (SDRAM) Slots
FAN 1-10	CPU/Chassis/Overheat Fan Headers
IPMI	IPMI Connector
I-SATA 0/1	Intel Serial ATA 0/1 Ports
J22	System Management Bus Connector
J24	System Management Bus Power Connector
J27	BIOS Debug
JCOM1/JCOM	COM1/COM2 Serial Port Headers
JD1	PWR LED (pins1-3)/Speaker Header (pins 4-7)
JF1	Front Control Panel Connector
JFDD1	Floppy Disk Drive Connector
JIDE1/2	IDE#1/IDE#2 Hard Disk Drive Connectors
JL1	Chassis Intrusion Header
JLAN 1/2	G-bit Ethernet Ports
JPW1	Primary 24-Pin ATX PWR Connector
JPW2	12V 8-Pin CPU PWR Connector
JWOR1	Wake-on-Ring Header
Keyboard	PS2 Keyboard Port
Mouse	PS2 Mouse Port
M-SATA	Marvell Serial ATA 4-Port Connection
UID	Unit Identifier Button/LED
USB0/1	Universal Serial Bus Ports
USB2/3	Universal Serial Bus Headers
VGA	Video Connector

5-8 Connector Definitions

ATX Power Connector

The X6DHP-TG includes a 24-pin main power supply connector (JPW1) that meets the SSI (Superset ATX) specification. You can only use a 24-pin power supply cable on the motherboard. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connector

In addition to the ATX power connector, the 12v 8-pin processor power connector at JPW2 must also be connected to your power supply for CPU power consumption to avoid causing instability to the system. See the table on the right for pin definitions.

Required Connection

Processor Power Pin Definitions (JPW2)

Pins	Definition
1 through 4	Ground
5 through 8	+12V

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	Vcc
16	Control

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

HDD LED

The HDD LED (for IDE and SATA drives) connection is located on pins 13 and 14 of JF1. Attach the drive LED cable to these pins to display disk activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

NIC1/2 LEDs

The NIC (Network Interface Controller) LED connections for GLAN1 are located on pins 11 and 12 of JF1 and the NIC LED connections for GLAN2 are located on pins 9 and 10 of JF1. Attach the NIC cables to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

Overheat/Fan Fail LED

Connect an LED to the OH/Fan Fail connection on pins 7 and 8 of JF1 to provide warning of system overheating or system fan failure. The LED will flash/stay on as long as the fan fail/overheat condition exists. Refer to the table on the right for pin definitions and Chapter 3 for details.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

UID Button & UID LED

A Unit Identifier button/LED is located next to the VGA port on the rear of the chassis and a UID LED and button (separate) are located on the front control panel. The UID LED connection is located on pins 3 and 4 of JF1. Refer to the table on the right for pin definitions and to page 5-21 for details.

UID & UID_LED Pin Definitions (JF1)

Pin#	Definition
3	Front UID
4	UID_LED

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see setting in BIOS). To turn off power in suspend mode, depress the button for at least 4 seconds.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

JLAN1/2 (Ethernet Ports)

Two gigabit Ethernet ports are located beside the VGA port. These ports accept RJ45 type cables.

Universal Serial Bus (USB0/1)

Two USB 2.0 ports are located beside the GLAN (Ethernet) ports. USB0 is the bottom port and USB1 is the top port. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions (USB0/1)

USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

Universal Serial Bus Headers

Two extra USB headers (at FPUSB2/ FPUSB3) can be used for front side USB access. You will need a USB cable to use these connections. Refer to the tables on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions (USB2/3)

USB2		USB3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	N/A

Fan Headers

There are ten fan headers (FAN1-FAN10) on the X6DHP-TG. These fans use DC power. See the table on the right for fan pin definitions.

Note: Fan speed is controlled by the "Fan Speed Control Mode" setting in BIOS (see page 7-16).

Fan Header Pin Definitions (Fan1-10)

Pin#	Definition	Color
1	Fan Power	Red
2	Tachometer	Yellow
3	Ground	Black
4	Ground	Grey
5	Tachometer	White
6	Fan Power	Orange

Serial Ports

There are two COM headers (JCOM1 and JCOM2) located between the Marvell SATA ports and the floppy connector. See the table on the right for pin definitions.

Serial Port Pin Definitions (JCOM1/JCOM2)

Pin #	Definition	Pin #	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin #	Function	Definition
4	+	Speaker data (red wire)
5	Key	No connection
6		Key
7		Speaker data

Wake-On-Ring

The Wake-On-Ring header is designated WOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions (WOR)

Pin#	Definition
1	Ground (Black)
2	Wake-up

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse ports are located beside the VGA port. See the table at right for pin definitions. (See Figure 5-4 for locations.)

PS/2 Keyboard and Mouse Port Pin Definitions

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

SMB

A System Management Bus header is located at J22. Connect the appropriate cable here to utilize SMB on your system.

SMB Header Pin Definitions (J22)

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

SMB Power Connector

Connect the SMB power connector to J24 (located near the ATX power connector) to utilize SMB.

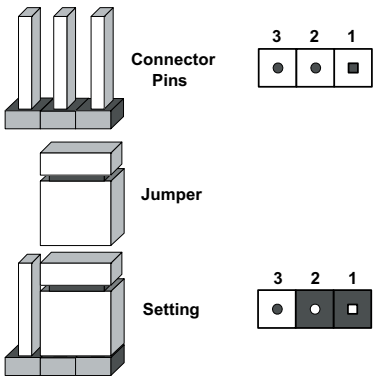
SMB Power (I^2C) Pin Definitions (J24)

Pin#	Definition
1	Clock
2	SMB Data
3	N/A
4	N/A
5	N/A

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.



Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,
1) First power down the system and unplug the power cord(s)
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver
3) Remove the screwdriver (or shorting device)
4) Reconnect the power cord(s) and power on the system.

VGA Enable/Disable

JPG1 enables or disables the VGA port on the serverboard. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

JLAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard LAN ports (JLAN1 and JLAN2) on the serverboard. See the table on the right for jumper settings. The default setting is enabled

JLAN Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SATA Enable/Disable

Close pins 1 and 2 of JPS1 to enable the Marvell SATA controller. See the table on the right for jumper settings. The default setting is enabled.

SATA Enable/Disable Jumper Settings (JPS1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

BIOS Debug

Close pins 2 and 3 of J27 to allow the system to search for the rescue disk from the floppy drive to refresh the BIOS when the BIOS crashes. See the table on the right for jumper settings. The default setting is pins 1 and 2 closed (normal).

Watch Dog

JWD1 controls Watch Dog, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will cause WD to reset the system if an application is hung up. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that is hung up. See the table on the right for jumper settings. Watch Dog can also be enabled via BIOS.

Note: When enabled, the user needs to write his own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD1)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

Memory Speed Select

Use XJ4F1 and XJ4F2 to select the speed of the system memory. See the table on the right for jumper definitions. The default setting is closed (DDR333).

Note: if these jumpers are not set correctly, you may experience problems with your video display.

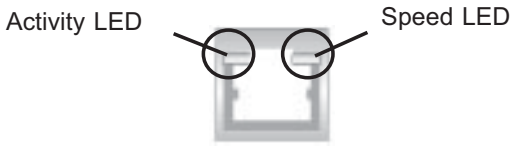
Memory Speed Select Jumper Settings (XJ4F1, XJ4F2)

XJ4F1	XJ4F2	Definition
Closed	Closed	333 MHz (DDR333)
Open	Open	266 MHz (DDR266)

5-10 Onboard Indicators

JLAN LEDs

The Gigabit Ethernet LAN ports (located beside the VGA port) each have two LEDs. The left LED indicates activity while the right LED may be green, amber or off to indicate the speed of the connection. See table at right for the functions associated with the second LED.

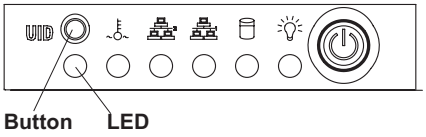


JLAN Right LED (Connection Speed Indicator	
LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

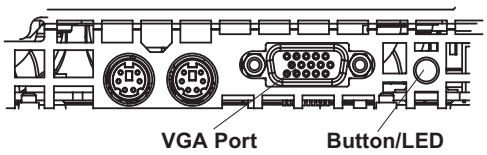
Unit Identifier

A Unit Identifier (UID) feature on the server makes it easy to locate the unit in a large stack. While servicing the system, if you find you need to work on the other side of the unit, push the UID button (located on the far left of the control panel on the front and to the right of the VGA port on the rear of the chassis) to illuminate an LED on the other side of the chassis. When you walk around to the other side of the rack, the unit will then be easy to spot. The LED will remain on until the UID button is pushed again. The rear chassis UID is a button and LED in one. The front control panel includes a separate LED and button.

UID: Front Chassis Location



UID: Rear Chassis Location



5-11 Floppy and Hard Disk Drive Connections

Note the following when connecting the floppy and hard disk drive cables:

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Floppy Connector

The floppy connector is located on JFDD1. See the table to the right for pin definitions.

Floppy Drive Connector Pin Definitions (JFFD1)

Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

IDE Connectors

There are no jumpers to configure the onboard IDE#1 and #2 connectors. See the table below for pin definitions.

IDE Drive Connectors
Pin Definitions (JIDE#1, JIDE#2)

Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC814+T-560/SC814+T-R560 chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required

The only tool you will need to install components and perform maintenance is a Philips screwdriver.

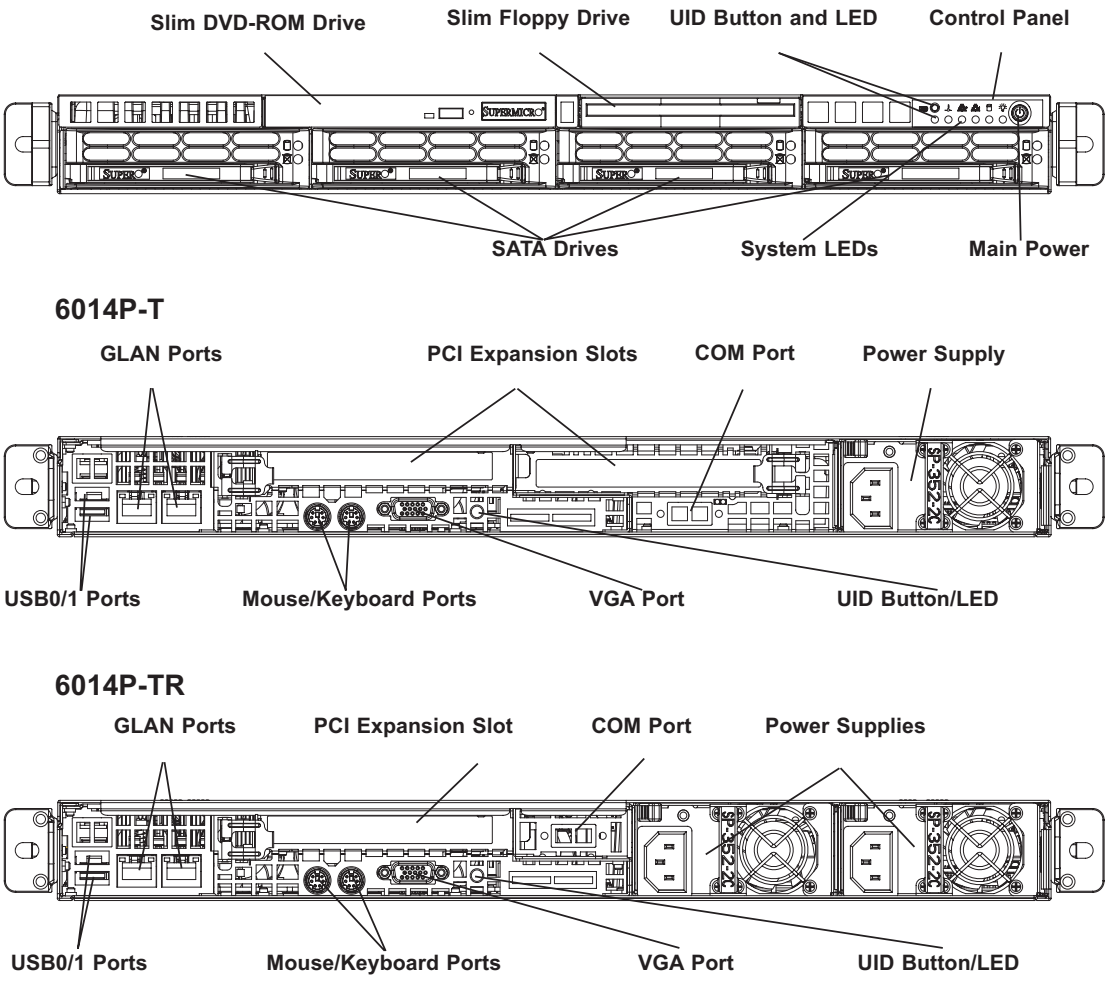
6-1 Static-Sensitive Devices

Electricstatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Figure 6-1. Chassis: Front and Rear Views



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3 System Fans

Five 40-mm fans provide the cooling for the 6014P-T/6014P-TR. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. These fans can adjust their speed according to the heat level sensed in the system, which results in more efficient and quieter fan operation. Fan speed is controlled by a setting in BIOS (see page 7-16). Each fan in a set has its own separate tachometer.

It is very important that the chassis top cover is properly installed for the airflow to circulate properly through the chassis and cool the components.

System Fan Failure

If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover (see instructions on p. 2-8) while the system is still running to determine which of the five fan units has failed. Then power down the system before replacing a fan. Removing the power cord(s) is also recommended as a safety precaution.

Replacing System Cooling Fans

1. Removing a fan

After turning off the power to the system, first remove the chassis cover (refer to page 6-7) and unplug **all** the fan cables from the motherboard. Grasp the rectangular housing that holds all the fan units and lift it out of the chassis (see Figure 6-2). Push the failed fan out through the bottom of the fan housing.

2. Installing a new fan

Replace the failed fan with an identical 40-mm, 12 volt fan (available from Supermicro: p/n FAN-0079). Push the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. Reposition the fan housing back over the two mounting posts in the chassis, then reconnect the fan wires to the same chassis fan headers you removed them from. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

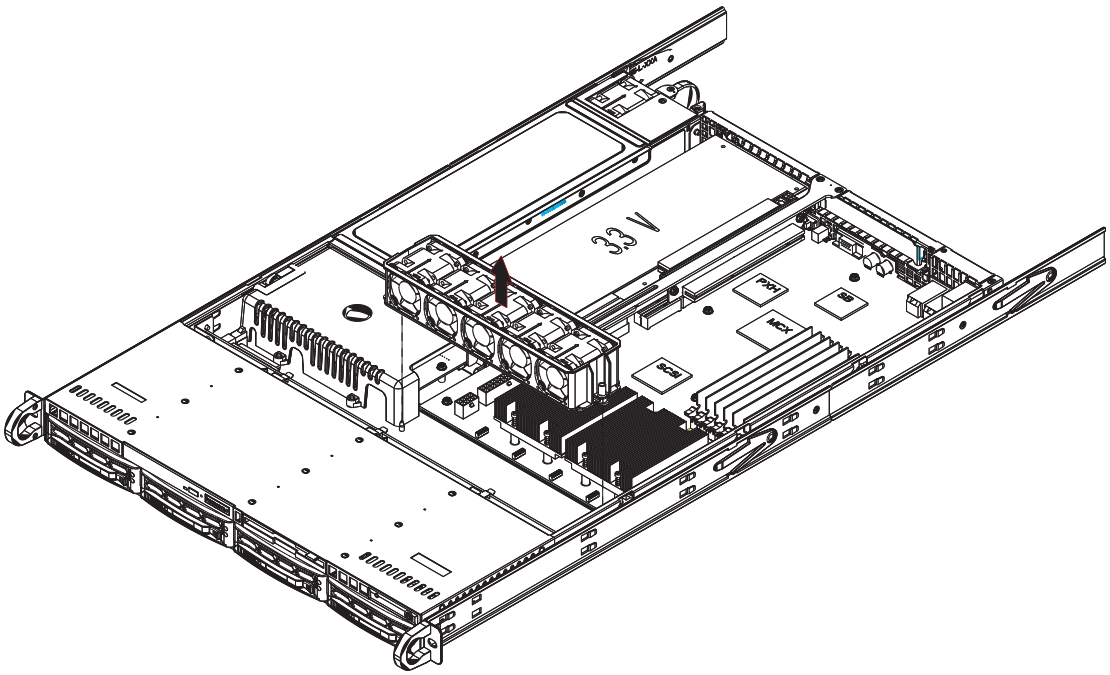


Figure 6-2. Removing the Fan Housing

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

Serial ATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SATA drives. Proceed to the next step for instructions.

Note: You must use standard 1" high, Serial ATA drives in the SuperServer 6014P-T/6014P-TR.

DVD/CD-ROM/Floppy Disk Drives: For installing/removing a DVD/CD-ROM or floppy disk drive, you will need to gain access to the inside of the system by removing the top cover of the chassis. Proceed to the "DVD/CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

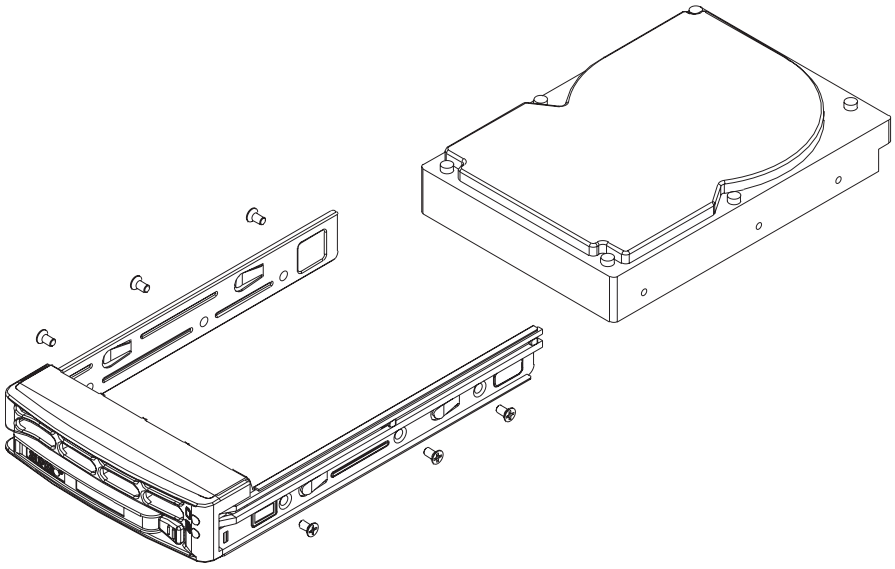
Note: Only "slim" DVD/CD-ROM and floppy drives will fit into the 6014P-T/6014P-TR.

Serial ATA Drive Installation

1. Mounting a Serial ATA drive in a drive carrier

The Serial ATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the Serial ATA drive bays. For this reason, even empty carriers without Serial ATA drives installed must remain in the chassis. To add a new Serial ATA drive, install a drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier. Secure the drive to the carrier with six screws, as shown in Figure 6-3.

Figure 6-3. Mounting a SATA Drive in a Carrier



Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

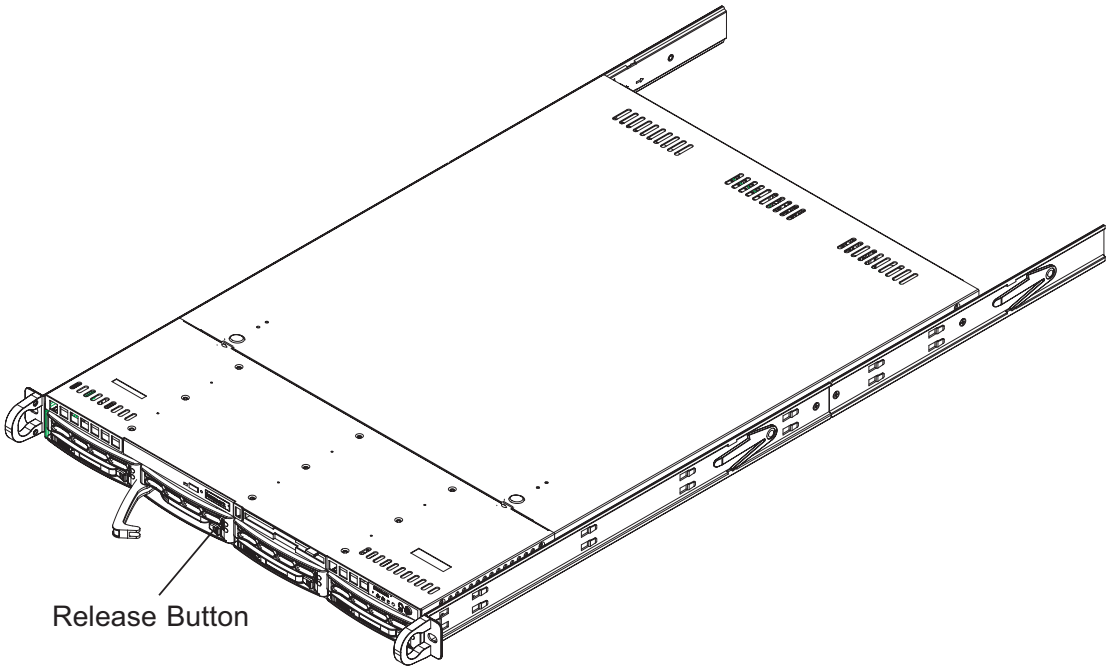
<u>Important:</u> Regardless of how many SATA hard drives are installed, all SATA drive carriers must remain in the drive bays for proper airflow.

2. Installing/removing hot-swap SATA drives

The SATA drive carriers are all easily accessible at the front of the chassis. These hard drives are hot-pluggable, meaning they can be removed and installed without powering down the system. To remove a carrier, push the release button located beside the drive LEDs. Then swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-4).

Note: Your operating system must have RAID support to enable the hot-plug capability of the SATA drives.

Figure 6-4. Removing a Serial ATA Drive Carrier



Important: All of the Serial ATA drive carriers must remain in the drive bays to maintain proper cooling airflow.

Serial ATA Backplane

The Serial ATA drives plug into a backplane that provides power, drive ID and bus termination. A RAID controller can be used with the backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the Serial ATA drives. The backplane is already preconfigured, so there are no jumpers or switches present on it.

DVD/CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD/CD-ROM and floppy drive bays. The 6014P-T/6014P-TR accomodates only slim DVD/CD-ROM and floppy drives. Side mounting brackets are needed to mount the DVD/CD-ROM drive in the server.

You must power down the system before installing or removing a floppy or DVD/CD-ROM drive. First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

With the chassis cover removed, unplug the power and data cables from the drive you want to remove. Then locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis. Pull the tab away from the drive and push the drive unit out the front of the chassis. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system. Please be aware of the following:

- The floppy disk drive cable has seven twisted wires.

- A color mark on a cable typically designates the location of pin 1.

6-5 Power Supply

6014P-TR

The SuperServer 6014P-TR has a redundant 560 watt redundant power supply configuration consisting of two hot-swappable power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with a 100V - 240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Power On LED on the control panel will turn yellow and remain on until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

Removing/Replacing the Power Supply

You do not need to shut down the system to replace a power supply module. The redundant feature will keep the system up and running while you replace the failed hot-swap module. Replace with the same model - SP562-1R (p/n PWS-0057), which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. Removing the power supply

First unplug the power cord from the failed power supply module. To remove the failed power module, first locate the colored release tab (1). Push the tab to the right (2) and then pull the module straight out with the handle provided (3) (Figure 6-5, single power supply server shown). The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

2. Installing a new power supply

Replace the failed hot-swap module with another SP562-1R power supply module. Simply push the new power supply module into the power bay until you hear a click. Finish by plugging the AC power cord back into the module.

6014P-T

The SuperServer 6014P-T has a single 560 watt cold-swap power supply, which is auto-switching capable. This enables it to automatically sense and operate with a 100v - 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Failure

If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface). As there is only one power supply module in the 6014P-T, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

Removing/Replacing the Power Supply

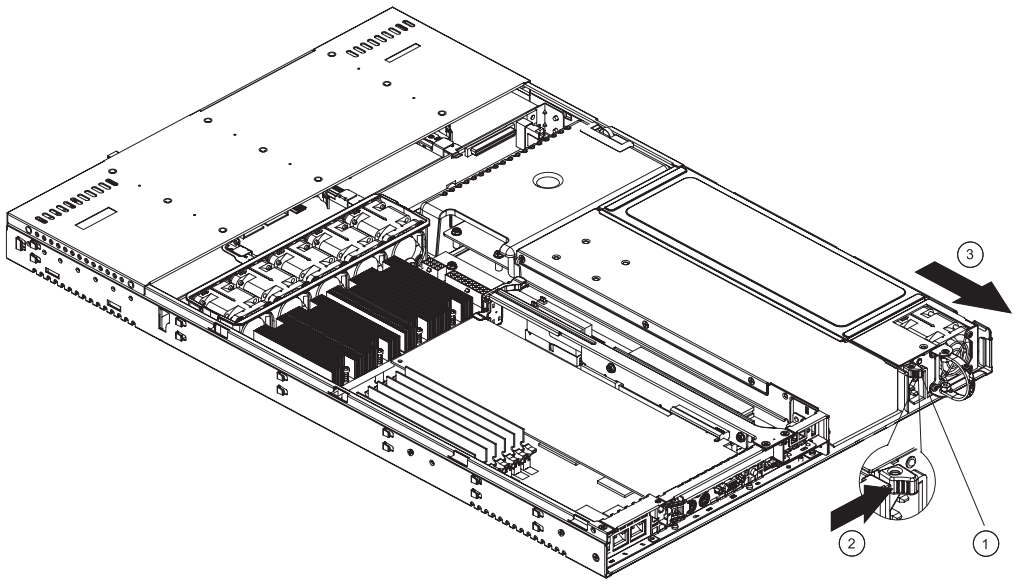
1. Removing the power supply

First turn the power switch on the control panel off, then unplug the power cord from the system. To remove the failed power module, first locate the colored release tab (1). Push the tab to the right (2) and then pull the module straight out with the handle provided (3) (Figure 6-5). The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

2. Installing a new power supply

Replace the failed power supply with another SP562-1R power supply module (p/n PWS-0057). Carefully insert the new power supply into the open bay and push it completely into the chassis until you hear a clicking sound, meaning it has been fully inserted. Finish by reconnecting the AC power cord and depressing the power button on the chassis front control panel.

Figure 6-5. Removing/Replacing the Power Supply



Reconfiguring the Power Supply

Although the standard configuration for the 6014P-T and 6014P-TR is with single and dual (redundant) power supplies respectively, you can reconfigure the 6014P-T to hold two power supply modules or (not recommended) the 6014P-TR to hold a single power supply module. The alternate backpanel section you will need for either operation has been included with the system.

Note: in the following instructions, "right" and "left" refers to the side noted when viewed from the rear of the system.

Reconfiguring the 6014P-T (see Figure 6-6)

1. You will first need to power down the system and remove the power cord. To gain access to the inside of the system, pull the server out from the rack and remove the top chassis cover by following the instructions on page 2-8.

2. Remove any expansion card that may be installed in the right-side riser card.

3. Remove the three screws that secure the riser card bracket, which runs from the primary ATX power connector to the rear of the chassis. After the screws are removed, lift the riser card bracket out from the chassis.

4. At the rear of the power distribution board (where the second power supply is inserted), there is a vertical shield that protects the second power supply slot. Remove this shield by grasping and forcibly pulling it off the cover that protects the power distribution board.

5. Remove the COM port header from the backpanel while keeping it connected to the serverboard.

6. Remove the three screws (two on the bottom and one on the side) that secure the right backpanel section to the chassis, then remove the backpanel section (Figure 6-6, step 1). Locate the alternate backpanel section (included in the accessory box) and attach it to the chassis with the same screws you just removed (Figure 6-6, step 2).

7. Reattach the COM port header to the proper space on the new backpanel section.

8. Reinstall the riser card bracket.

9. Insert a new power supply module, pushing it all the way into the empty bay until it clicks into place.

10. Replace the chassis cover, push the system back into the rack and reconnect the power cords (to both power modules now). Power up the system.

Reconfiguring the 6014P-TR (see Figure 6-7)

Reconfiguring the 6014P-TR as a single power supply system is not recommended by Supermicro. However, if you do wish to reconfigure the system, please carefully follow the instructions below.

1. First, power down the system and remove the power cords from both power modules, as well as the left-side (when viewed from the rear of the system) power supply. To gain access to the inside of the system, pull the server out from the rack and remove the top chassis cover by following the instructions on page 2-8.

2. Once the cover is removed and you have full access to the inside of the system, begin by removing the three screws that secure the riser card bracket, which runs from the primary ATX power connector to the rear of the chassis. After the screws are removed, lift the riser card bracket out from the chassis.

3. Remove the COM port header from the backpanel while keeping it connected to the serverboard.

4. Remove the three screws (two on the bottom and one on the side) that secure the right backpanel section to the chassis, then remove the backpanel section (Figure 6-6, step 2). Locate the alternate backpanel section and attach it to the backpanel with the same screws you just removed (Figure 6-6, step 1).

5. Pull the left-side (when viewed from the rear of the system) power supply out of the chassis. Note that the power distribution board contacts for this power supply are now exposed. Supermicro does not supply a shield to protect these contacts, you must do so on your own.

6. Reinstall the riser card bracket.

7. You may now add a left-side riser card (purchased separately*) and a PCI-X/PCI-Express expansion card in the space vacated by the second power supply module, if desired.

8. Reattach the COM port header to the space provided in the new backpanel section.

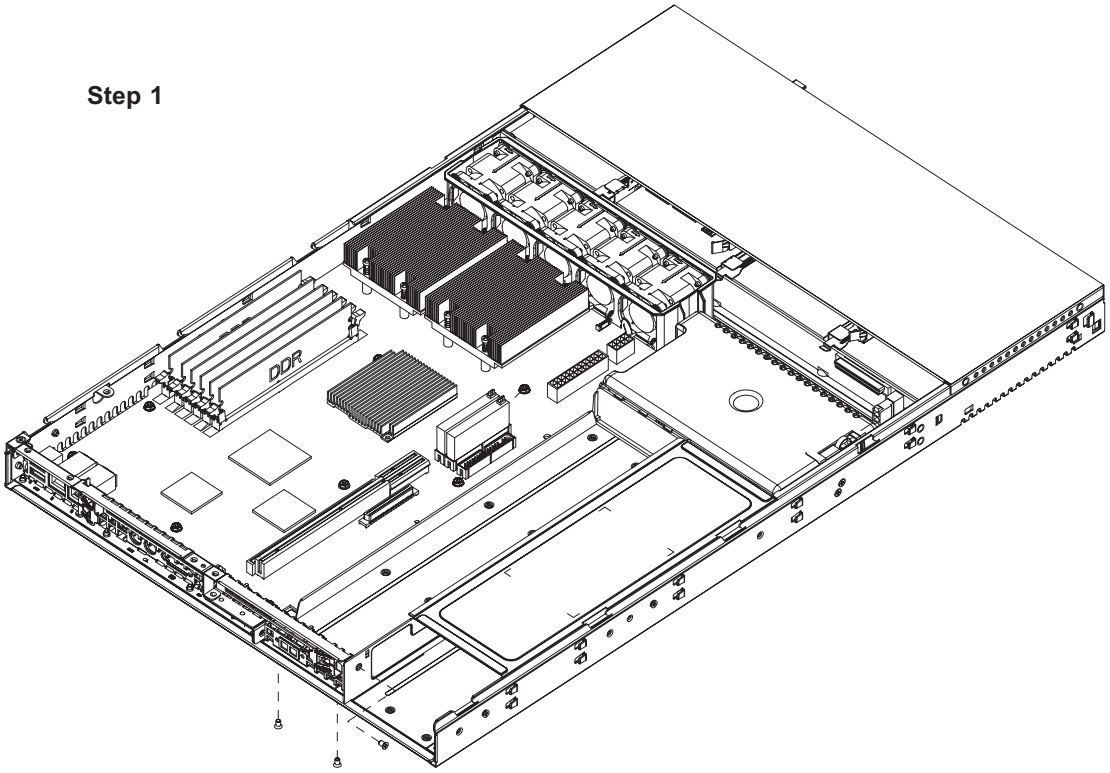
9. Replace the chassis cover, push the system back into the rack and reconnect the power cord (to only a single power module now). Power up the system.

* CSE-RR1U-X (for PCI-X cards) or CSE-RR1U-EL (for PCI-Express cards).

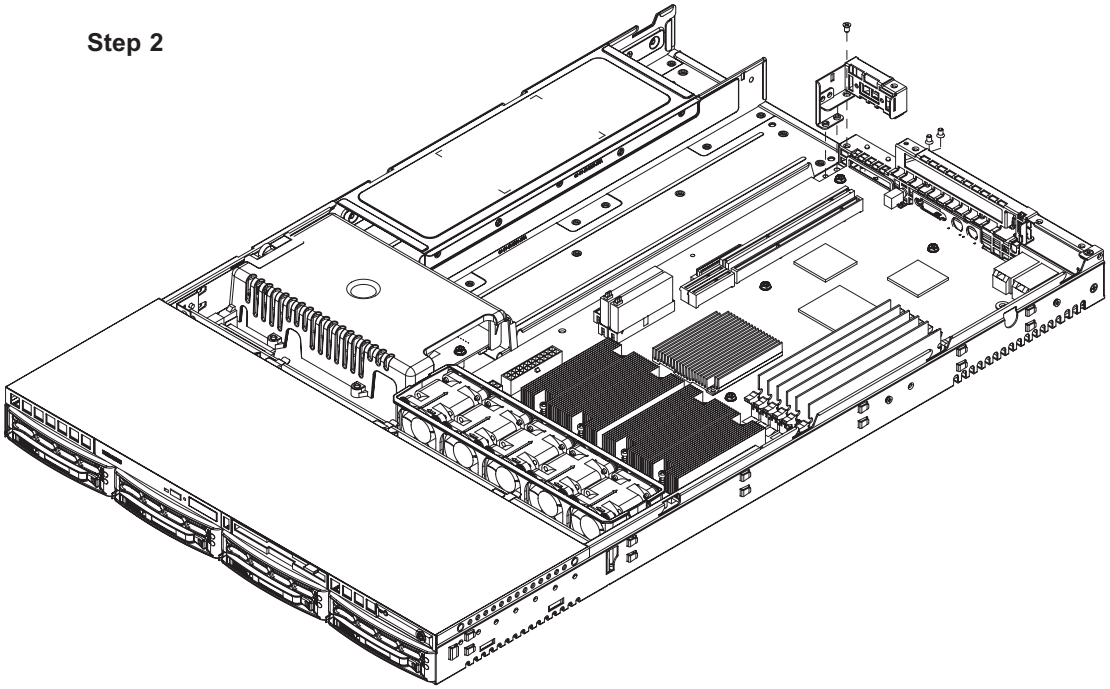
Important: Reconfiguring the 6014P-TR as a single power supply system is not recommended. If you do reconfigure the 6014P-TR, it is extremely important that you install a shield (not included) to protect the power distribution board contacts that were used by the second power supply module (see step 5 above).

Figure 6-6. Reconfiguring the Power Supply

Step 1



Step 2



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X6DHP-TG. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.) Options printed in Bold are the default settings.

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

Note: fan speed is controlled by the “Auto Fan Control” setting in BIOS. The recommended (default) setting for the 6014P-T/6014P-TR is “3-pin (Server)”. The fan speed setting is decribed on page 7-16.

7-2 Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

(*Note: Please load "System Setup Default" when using the system the first time.)

7-3 Main BIOS Setup

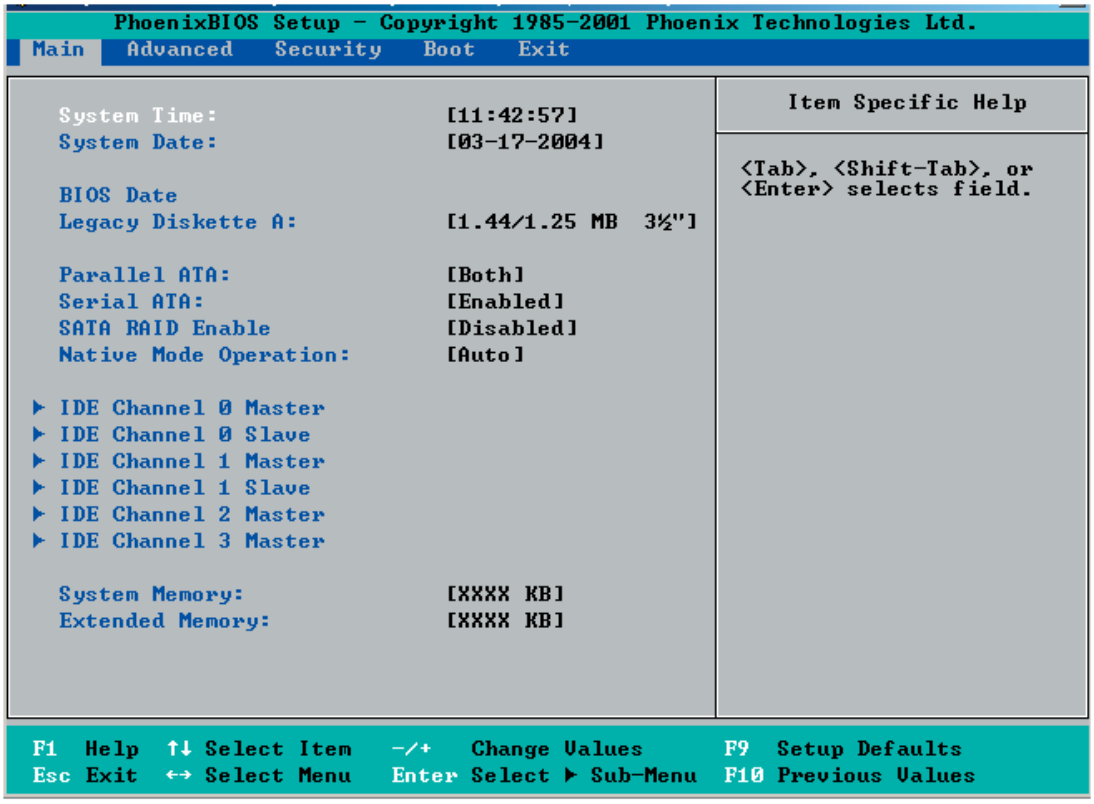
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
System Time: [11:42:57]
System Date: [03-17-2004]
BIOS Date
Legacy Diskette A: [1.44/1.25 MB 3½"]
Parallel ATA: [Both]
Serial ATA: [Enabled]
SATA RAID Enable [Disabled]
Native Mode Operation: [Auto]
IDE Channel 0 Master
IDE Channel 0 Slave
IDE Channel 1 Master
IDE Channel 1 Slave
IDE Channel 2 Master
IDE Channel 3 Master
System Memory: [XXXX KB]
Extended Memory: [XXXX KB]
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This feature allows BIOS to automatically display the BIOS date.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB, 3.5** in and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, Channel 0, Channel 1 and **Both.**

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Serial ATA RAID Enable

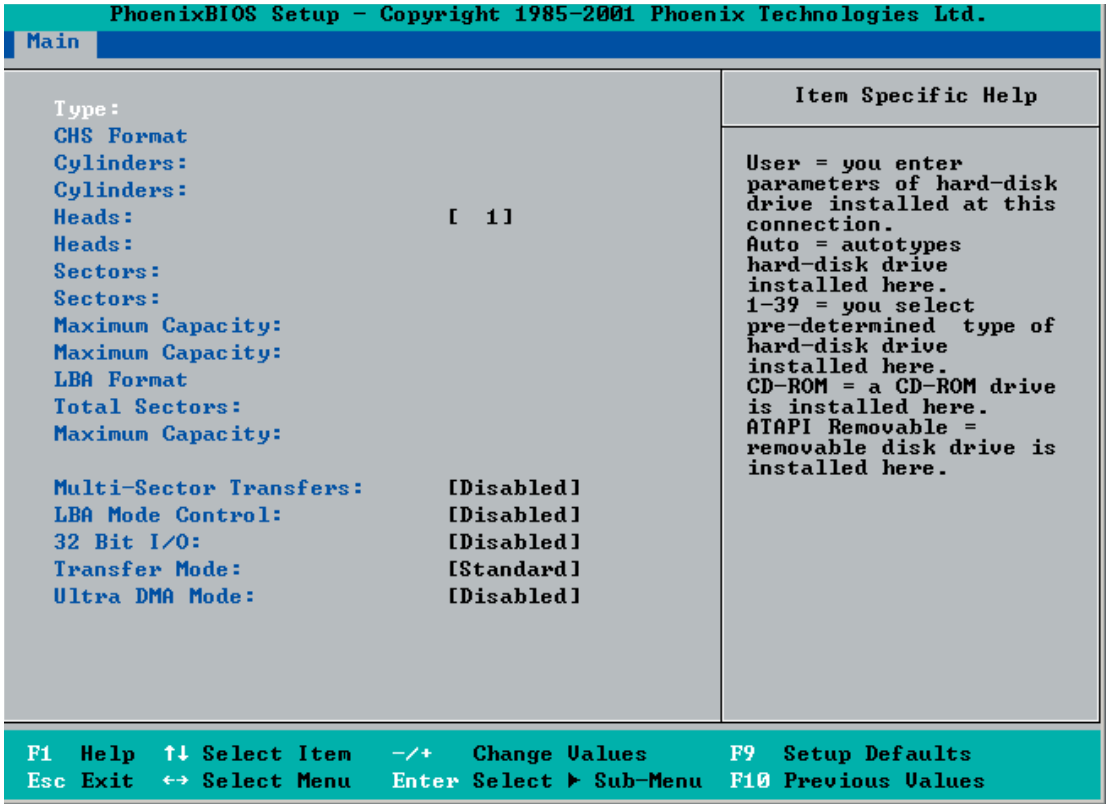
Select Enable to enable Serial ATA RAID Functions. (*For the OS environment, use the RAID driver if this feature is set to Enabled.) The default setting is **Disabled**.

Native Mode Operation

Select the native mode for ATA. The options are: Parallel ATA, Serial ATA, Both, and **Auto**.

▶IDE Channel 0 Master/Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master

These settings allow the user to set the parameters of IDE Channel 0 Master/ Slave, IDE Channel 1 Master/Slave, IDE Channel 2 Master, IDE Channel 3 Master slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main
Type:
CHS Format
Cylinders:
Cylinders:
Heads: [1]
Heads:
Sectors:
Sectors:
Maximum Capacity:
Maximum Capacity:
LBA Format
Total Sectors:
Maximum Capacity:
Multi-Sector Transfers: [Disabled]
LBA Mode Control: [Disabled]
32 Bit I/O: [Disabled]
Transfer Mode: [Standard]
Ultra DMA Mode: [Disabled]
Item Specific Help
User = you enter parameters of hard-disk drive installed at this connection.
Auto = autotypes hard-disk drive installed here.
1-39 = you select pre-determined type of hard-disk drive installed here.
CD-ROM = a CD-ROM drive is installed here.
ATAPI Removable = removable disk drive is installed here.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Type

Selects the type of IDE hard drive. The options are **Auto**, (which allows BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CD-ROM and ATAPI Removable. The "User" option will allow the user to enter the parameters of the HDD installed at this connection. The "Auto" option will allow BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option 1-39 to select a predetermined HDD type. Select CD-ROM if a CD-ROM drive is installed. Select ATAPI if a removable disk drive is installed.

Multi-Sector Transfer

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 4 Sectors, 8 Sectors and **16 Sectors**.

LBA Mode Control

This item determines whether Phoenix BIOS will access the IDE Channel 0 Master Device via the LBA mode. The options are **Enabled** and Disabled.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

Selects the transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

Selects Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4 and Mode 5.

System Memory

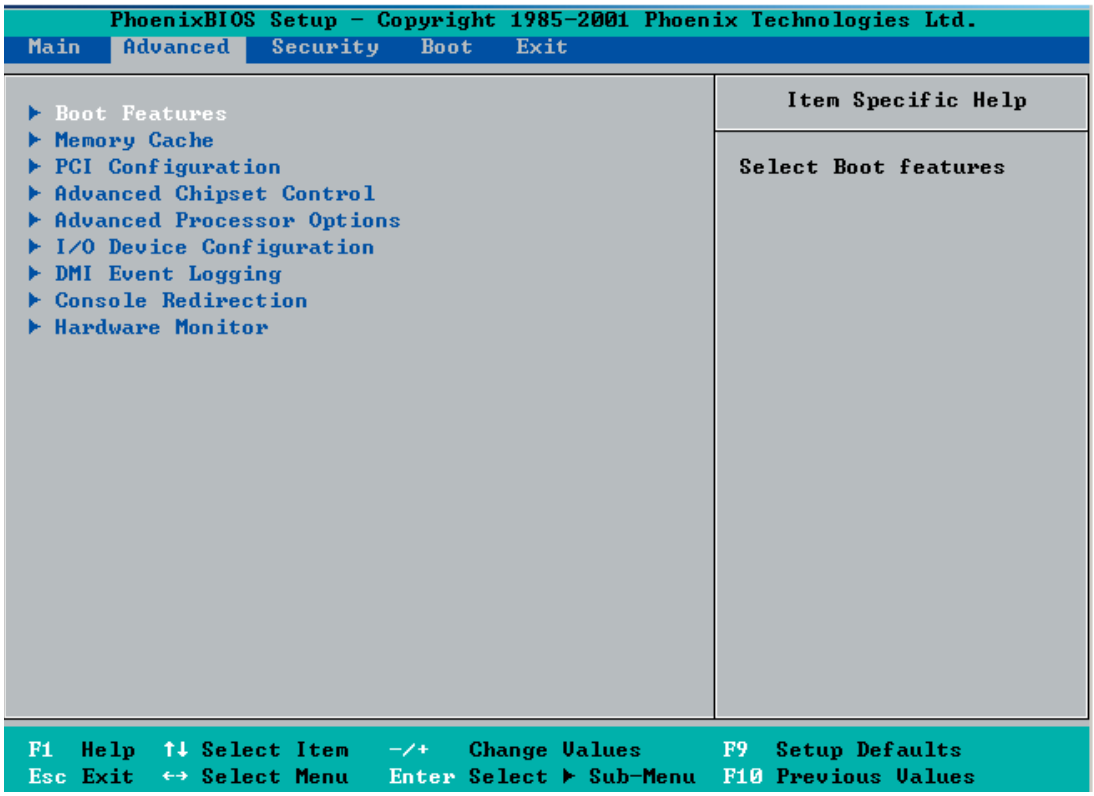
This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

7-4 Advanced Setup

Choose Advanced from the main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS setup options are described in this section.



▶Boot Features

Access the submenu to make changes to the following settings.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

Allows you to **Enable** or Disable the diagnostic screen during boot-up.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

Power Button Behavior

If set to Instant-Off, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are **instant-off** and 4-sec override.

After Power Failure

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are **Stay Off** and Power On.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

After Power Failure

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are **Stay Off** and Power On.

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable this function, and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable the function and this area will be reserved for Video BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DRM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are "Uncached", "Write Through", "Write Protect", and **"Write Back"**.

Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. Select enabled to enhance graphic performance when you use a Linux graphics driver that requires write-combining with 4GB or more memory. The options are Enabled and **Disabled**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are **Disabled** and Enabled.

.Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

Frequency for PCIX#1/GLAN

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

Frequency for PCIX#2/MASS

This option allows the user to change the bus frequency of the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

▶PCI-X 100MHz Slot#1, PCI-X 100MHz Slot#2 w/ZCR, PCI-Express x8 Slot#1, PCI-Express x8 Slot#2

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater Clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software , you might want to change this setting and try again. Different OS requires different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novellle NetWare and other operating systems).

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Force Compliance Mode

This feature allows you to enable the PCI-Express Compliance Mode. The options are: **Disabled** or Enabled.

Memory RAS Feature Control

Select this option in order to enable the special feature of DIMM sparing or memory mirroring. The options are Mirroring, Sparing and **Standard**.

Clock Spectrum Feature

If "Enabled", BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

DRAM Data Integrity Mode

If enabled, this feature allows the data stored in the DRMA memory to be integrated for faster data processing. The options are 72-bit ECC, 144-bit ECC, **Auto** and Disabled.

ECC Error Type

This setting lets you select which type of interrupt to be activated as a result of an ECC error. The options are None, NMI (Non-Maskable Interrupt), **SMI** (System Management Interrupt) and SCI (System Control Interrupt.)

SERR Signal Condition

This setting specifies the ECC Error conditions that an SERR# is to be asserted. The options are None, **Single Bit**, Multiple Bit and Both.

USB Function

This setting allows you to **Enable** or Disable all functions for the Onboard USB devices. The options are **Enabled** and Disabled.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Hyper-threading

This setting allows you to **Enable** or Disable the function of Hyper-Threading. Enabling Hyper Threading results in increased CPU performance. (Applicable for the XP systems.)

Machine Checking

Enable to allow the operating system to debug a system crash after a reset. The options are **Disabled** and Enabled.

Adjacent Cache Line Prefetch

The CPU fetches the cache line for 64 bytes if Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

Processor Power Management

This feature allows you to decide how processor power is managed. If set to Disabled, processor power is not managed based on the power demand on the CPU, and demand-based power switching is not allowed. If set to GV3, processor power will be controlled by the Bus Ratio and CPU voltage. Demand-based switching is allowed. The options are **Disabled** and GV3.

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock input

This setting allows you to set the clock frequency for the Keyboard Clock. The options are 8MHz, **12 MHz** and 16MHz.

Onboard COM1

This setting allows you to assign control of Onboard COM1. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for COM1. The options are **3F8/IRQ4**, 2F8/IRQ3, 3E8/IRQ4 and 2E8/IRQ3.

Onboard COM2

This setting allows you to assign control of Onboard COM2. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for COM2. The options are **3F8/IRQ4**, 2F8/IRQ3, 3E8/IRQ4 and 2E8/IRQ3.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specifies to redirect the console to Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K and 115.2K.

Console Type

This item allows you to choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, VT-UTF8.

Flow Control

This item allows you to choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to choose select the console connection: either **Direct** or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.

Serial Port B

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

Specify the type of device that will be connected to serial port B. The options are **Normal**, and IR (for an infrared device).

Base I/O Address

Select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS-or OS- controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

Select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

This feature allows you to specify the parallel port mode. The options are Output only, Bi-Directional, EPP and **ECP**.

PCI-E Express Jitter Tolerance

This feature allows the user to set the PCI-E Jitter Tolerance Level. The options are: **4** to 12.

PCI-E Port A Device 2/PCI-E Port B Device 4

If enabled, the feature allows you to set the device selected to be compliant with the PCI-Express Compliance 1.0 Mode. The options are: Disabled, Enabled and **Auto**.

▶Hardware Monitor Logic

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 75°C, **80°C**, 85°C and 90°C.

Highlight this and hit <Enter> to see the data for the following items:

Temperature: These items display the Temperature status of the following items.

CPU1 Temperature

CPU2 Temperature

LM93 Temperature

LM30 Temperature

Fan Speed Control Modes [Disable, 3-pin (Server)**]**

This feature allows the user to decide how the system controls the speeds of onboard fans. Select "Disable" to disable of the function of fan speed control and the system will run at the full speed (12V). Select **"3-pin Server"** to optimize the fan speed control via BIOS Thermal management.

Fan 1 - FAN 10: If the feature of Auto Fan Control is enabled, BIOS will automatically display the status of the fans indicated in this item.

Voltage: These items display the Voltage status of the following items.

P12V_CPU1-_Scaled

P12V_CPU2_Scaled

P12V_Scaled

CPU vio

MCH/PXH Vcore

ICH Vcore

CPU1 Vcore

CPU2 Vcore

P3V3

P5V

P1V8

Vdimm

HECETA_MEM_VTT

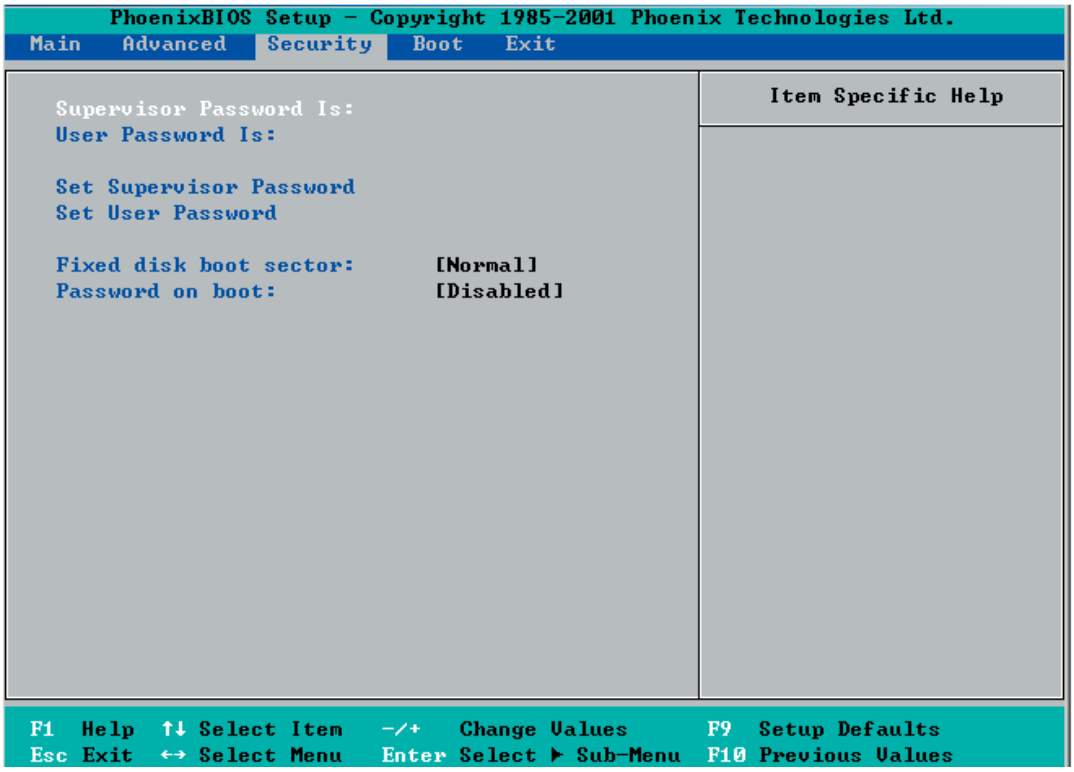
P1V0_NIC

N12V_Scaled

P3V3_STBY

7-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Item Specific Help
Supervisor Password Is:
User Password Is:
Set Supervisor Password
Set User Password
Fixed disk boot sector: [Normal]
Password on boot: [Disabled]
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

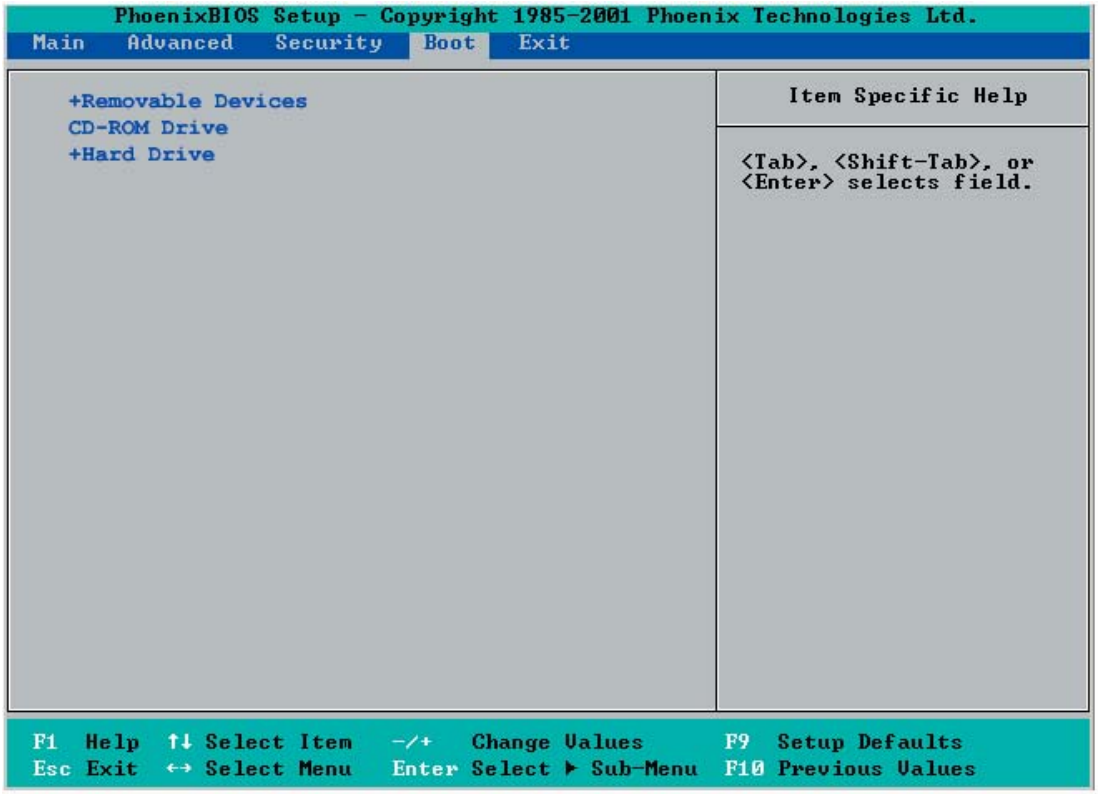
This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. The options are Enabled (password required) and Disabled (password not required).

7-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
+Removable Devices
CD-ROM Drive
+Hard Drive
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of devices in the Item Specific Help window.

CDROM Drive

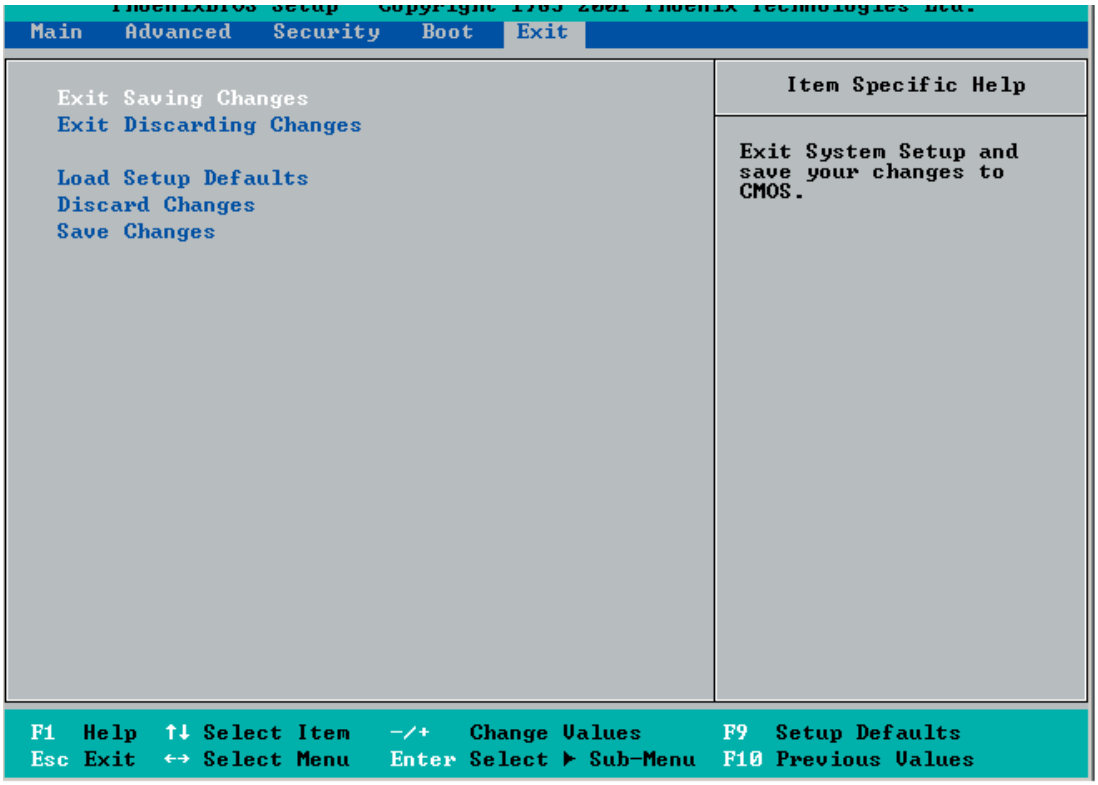
See details on how to change the order and specs of the CDROM drive in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.



Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Notes

Appendix A
BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the Phoenix BIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error
1 repetitive long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line ***xxxx****
2Eh	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt “Press F2 to enter SETUP”
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies
	Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) indicating the address line or bits that failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix B

Software Installation

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID Driver before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard. (For Adaptec's Host RAID Utility, please refer to the CDs that came with your system.)

B-1 Adaptec Embedded SATA RAID Controller Driver

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. SATA is a serial link which supports transfer rates from 150 MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while SATA cables can extend up to one meter. Overall, SATA provides better functionality than PATA.

Configuring BIOS settings for the SATA RAID Functions

1. Press the **Del** key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time to power on the system, we recommend that you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Menu. Once in the "Exit" Menu, scroll down the menu to select the item "Load Optimized Default Settings" and press the **Enter** key. Select **OK** to confirm the selection. Press the **Enter** key to load the default settings to the BIOS.

3. Use the arrow keys to select the "Main" Menu in BIOS.

4. Scroll down to the item "SATA RAID Enable", select **Enabled** and press **Enter**.

5. Tap the **Esc** key and scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the **Enter** key to save the changes and exit the BIOS.

6. Once you've exited the BIOS Utility, the system will re-boot.

7. During system startup, press the **Ctrl** and the **A** keys simultaneously to run the Adaptec RAID Configuration Utility when prompted by the message: "Press <Ctrl><A> for Adaptec RAID Configuration Utility".

Adaptec Embedded SATA with HostRAID Controller Driver

Adaptec's Embedded Serial ATA RAID with HostRAID controller adds RAID functionality to the Serial ATA I/O controller by supporting RAID 0 (Striping) or RAID 1 (Mirroring) to enhance the industry's pioneer PCI-to-e host controller products. RAID striping (RAID 0) can greatly improve hard disk I/O performance because of its capability in striping data across multiple drives. RAID mirroring (RAID 1) allows the data to be simultaneously written to two drives, so critical data is always available even if one hard disk fails.

Due to this built-in functionality, your Supermicro motherboard is specially designed to keep pace with the increasing performance demands of today's computer systems by improving disk I/O throughput and providing data accessibility regardless of a single disk failure. By incorporating Adaptec Embedded Serial ATA into the motherboard design, Supermicro offers the user the benefits of SATA RAID without the high costs associated with RAID hardware.

Note: For Adaptec's RAID Driver Installation Instructions, please refer to the Adaptec RAID Controller User's Guide: "Emb_SA_RAID_UG.pdf", which is located in the CD that came with this motherboard. You can also download a copy of Adaptec's User's Guide from our website at www.supermicro.com.

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility is an embedded BIOS Utility, including:

*Array Configuration Utility: Use this utility when you want to create, configure and manage arrays.

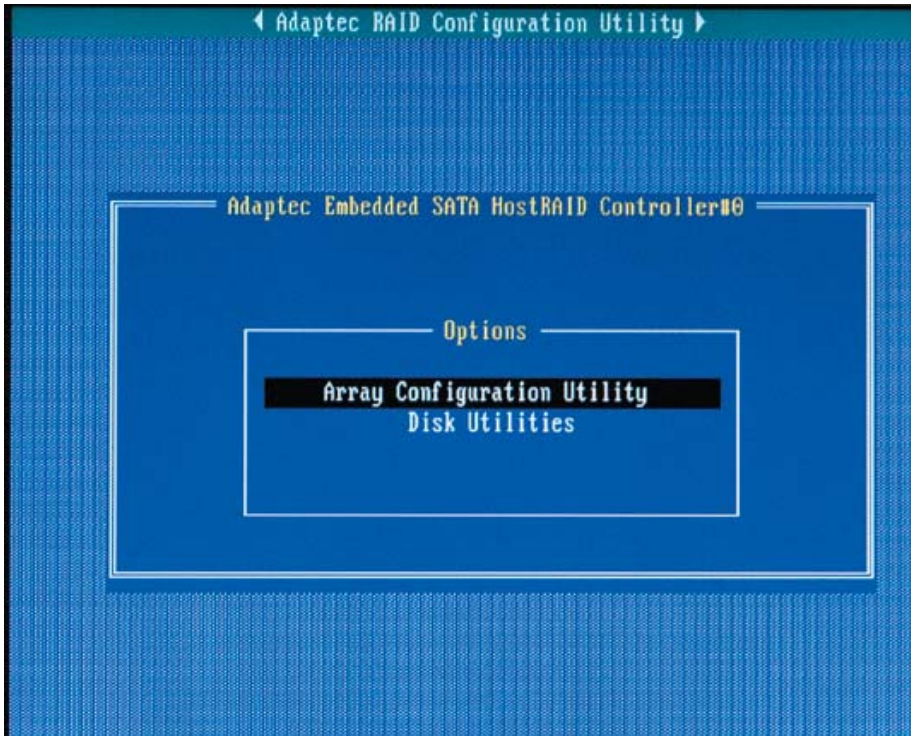
*Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to enable the RAID function in the system BIOS (refer to Chapter 7 for System BIOS Configurations), and then press the **Ctrl** and **A** keys simultaneously when prompted to do so during the system startup. (Refer to the previous page for detailed instructions.)

Note: To select an option, use the arrow keys to highlight the item and then press the **Enter** key to select it. To return to the previous menu, press the **ESC** key.

Using the Array Configuration Utility (ACU)

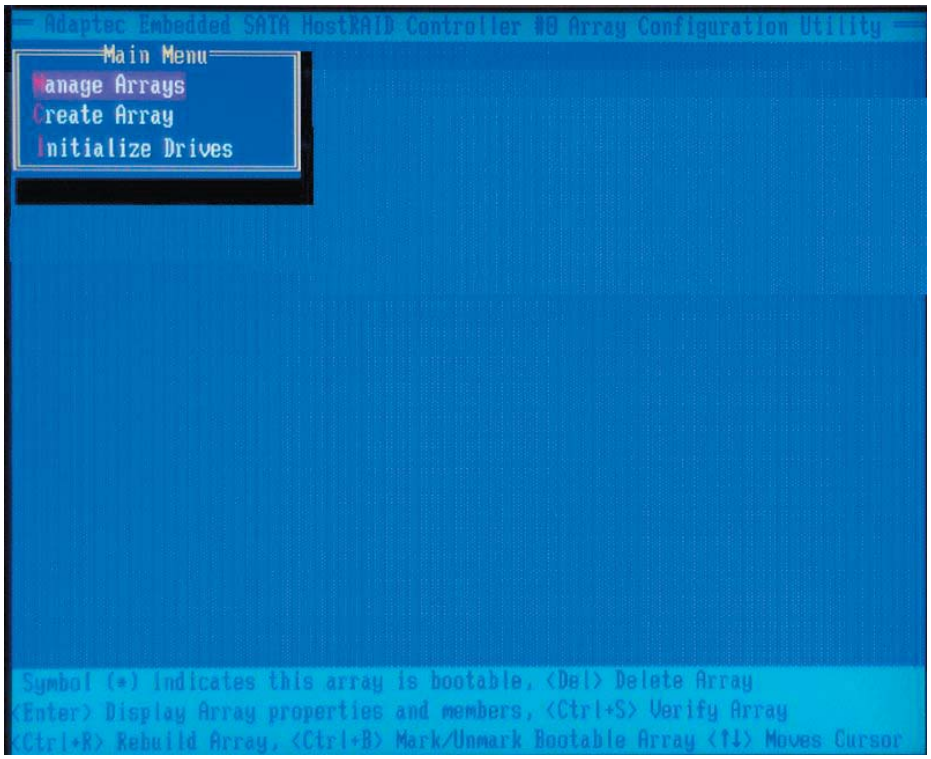
The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, add and delete spare drives, and initialize drives. During the system startup, press the **Ctrl** and **A** keys simultaneously, and the main menu will appear.



Managing Arrays

Select this option to view array properties and delete arrays. The following sections describe the operations Of "Managing Arrays".

To select this option, use the arrow keys and the **Enter** key to select **Managing Arrays** from the main menu (as shown below).


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Main Menu
anage Arrays
reate Array
nitialize Drives
Symbol (*) Indicates this array is bootable, <Del> Delete Array
<Enter> Display Array properties and members, <Ctrl+S> Verify Array
<Ctrl+R> Rebuild Array, <Ctrl+B> Mark/Unmark Bootable Array <↑↓> Moves Cursor

Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press **Ctrl+A**.

2. From the ARC menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays** (as shown on the previous screen.)

4. From the List of Arrays dialog box, select the array you want to view and press **Enter**.

The Array Properties dialog box appears, showing detailed

information on the array. The physical disks associated with the array are displayed here.

5. Press **Esc** to return to the previous menu.

Deleting Arrays

***Warning**: Back up the data on an array before you delete it to prevent the loss of data. Deleted arrays cannot be restored.*

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC main menu, select **Array Configuration Utility (ACU)**.

3. From the ACU menu, select **Manage Arrays**.

4. Select the array you wish to delete and press **Delete**.

5. In the Array Properties dialog box, select **Delete** and press **Enter**. The following prompt is displayed:

Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):

RAID 1 only - the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

6. Press **Yes** to delete the array or partition or **No** to return to the previous menu.

7. Press **Esc** to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized are shown in gray and cannot be used. See *Initializing Disk Drives*.

To create an array

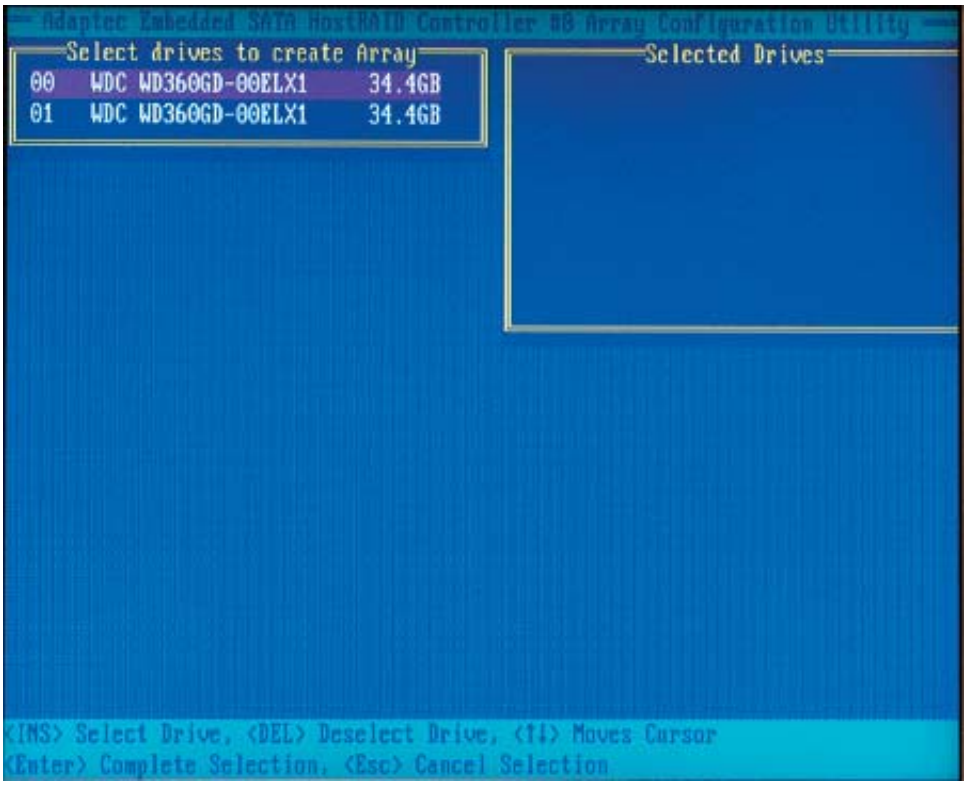
1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility Main Menu (ACU)** (as shown on the first screen on page B-4).

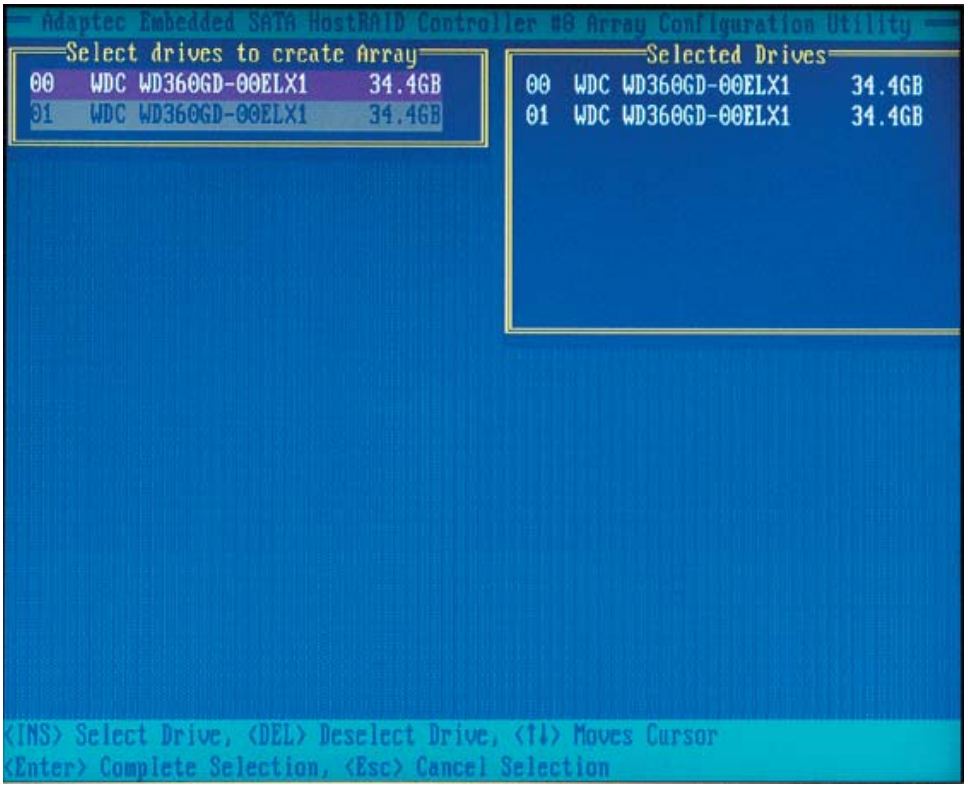
3. From the ACU menu select **Create Array**.

4. Select the disks for the new array and press **Insert** (as shown on the the screen below).

Note: To deselect any disk, highlight the disk and press **Delete**.


Select drives to create Array
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
Selected Drives
<INS> Select Drive, <DEL> Deselect Drive, <↑↓> Moves Cursor
<Enter> Complete Selection, <Esc> Cancel Selection

5. Press **Enter** when both disks for the new array are selected. The Array Properties menu displays (as the shown on the screen on the next page).


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Select drives to create Array
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
Selected Drives
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
<INS> Select Drive, <DEL> Deselect Drive, <↑↓> Moves Cursor
<Enter> Complete Selection, <Esc> Cancel Selection

Assigning Array Properties

Once you've create a new array, you are ready to assign properties to the array.

Caution: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. You will need to use the Adaptec Storage Manager - Browser Edition. (Refer to Adaptec's User's Guide in the enclosed CD.)

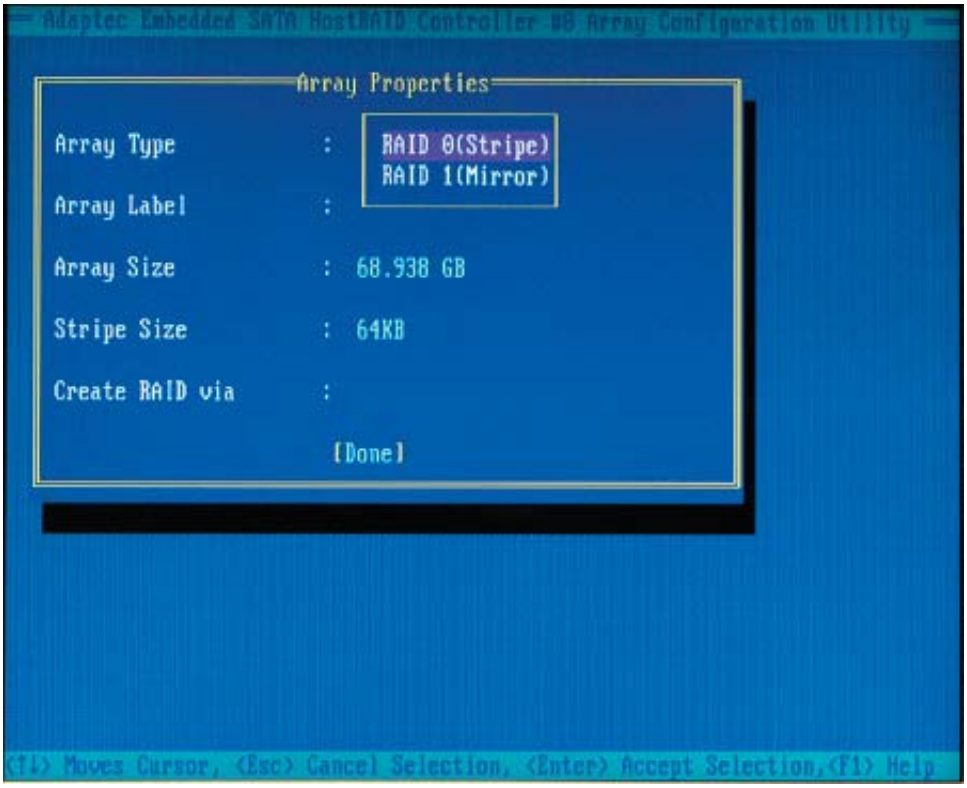
To assign properties to the new array

1. In the Array Properties menu (as shown on the following screen), select an array type and press **Enter**.

Note that only the available array types (RAID 0 and RAID 1) are displayed on the screen. (Using RAID 0 or RAID 1 requires two drives.)

2. Under the item "**Arrays Label**", type in a label and press **Enter**. The label cannot be more than 15 characters.

3. For RAID 0, select the desired stripe size. (Available stripe sizes are 16, 32, and 64 KB - default. It is recommended that you *do not* change the default setting.)


Adaptec Embedded SATA HostRAID Controller BB Array Configuration Utility
Array Properties
Array Type : RAID 0(Stripe)
RAID 1(Mirror)
Array Label :
Array Size : 68.938 GB
Stripe Size : 64KB
Create RAID via :
[Done]
(↑↓) Moves Cursor, (Esc) Cancel Selection, (Enter) Accept Selection, (F1) Help

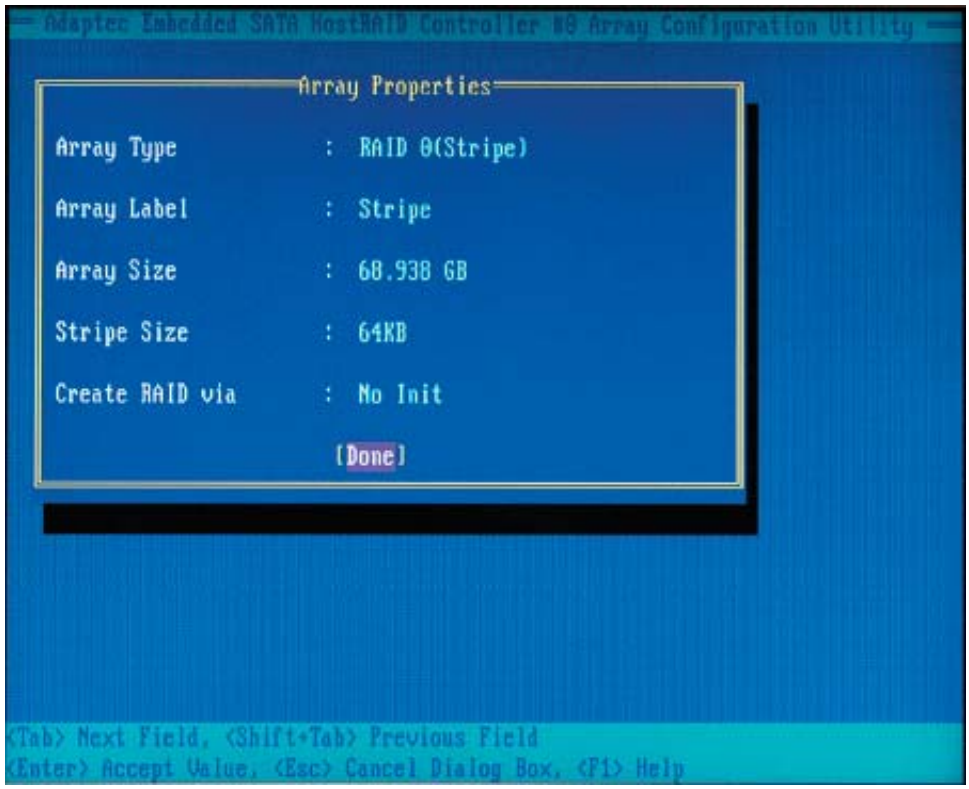
4. The item **"Create RAID via"** allows you to select between the different methods of creating RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

RAID Level	Create Via	When Appropriate
RAID0	No Init.	Creating a RAID0 on new drives
RAID0	Migrate*	Creating a RAID0 from one new drive with data you wish to preserve.
RAID1	Build1	Any time you wish to create a RAID1, but especially if you have data on one drive that you wish to preserve.
RAID1	Clear	Creating a RAID1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID1	Quick	Fastest way to create RAID1. Appropriate when using new drives.
RAID1	Init.	Fastest way to create RAID1. Appropriate when using new drives.

5. When finished, press **Done** (as shown on the following screen).

Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.


Adaptec Embedded SATA HostRAID Controller B0 Array Configuration Utility
Array Properties
Array Type : RAID 0(Stripe)
Array Label : Stripe
Array Size : 68.938 GB
Stripe Size : 64KB
Create RAID via : No Init
[Done]
<Tab> Next Field, <Shift+Tab> Previous Field
<Enter> Accept Value, <Esc> Cancel Dialog Box, <F1> Help

Notes

1. Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

2. If you stop the build or clear process on a RAID 1 from ACU, you can restart it by pressing **Ctrl+R**.

3. A RAID 1 created using the Quick Init option may return some data mis-compares if you later run a consistency check. This is normal and is not a cause for concern.

4. The ACU allows you to use drives of different sizes in a RAID. However, during a build operation, only the smaller drive can be selected as the source or first drive.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

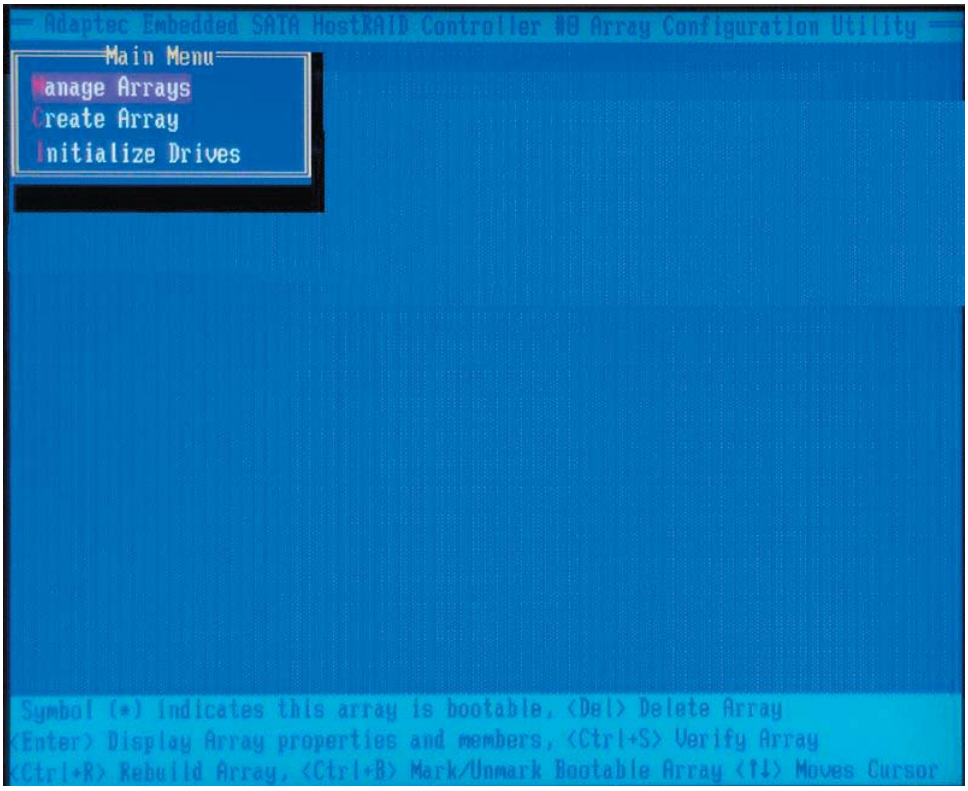
Warning: Do not interrupt the creation of RAID 0 using the Migrate option. If you do, you will not be able to restart or to recover the data that was on the source drive.

Adding a Bootable Array

1. From the Main menu, select **Manage Arrays.**

2. From the list of arrays, select the array you want to make bootable and press **Ctrl+B.**

3. Enter **Y** to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" A bootable array will then be created. An asterisk will appear next to the bootable array.


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Main Menu
anage Arrays
reate Array
nitialize Drives
Symbol (*) Indicates this array is bootable, <Del> Delete Array
<Enter> Display Array properties and members, <Ctrl+S> Verify Array
<Ctrl+R> Rebuild Array, <Ctrl+B> Mark/Unmark Bootable Array <↑↓> Moves Cursor

Deleting a Bootable Array

To delete a bootable array

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the bootable array (*) you want to delete and press **Ctrl+B**. (A bootable array is an array marked with an asterisk.)

3. Enter **Y** to delete a bootable array when the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No):" The bootable array will then be deleted and the asterisk will disappear.

Note: do not use the delete key to delete a bootable array.

Adding/Deleting Hotspares

Note: In order to rebuild a RAID (RAID 0 or RAID 1), you need to add a new HDD as a hotspare.

1. Turn on your computer and press **Ctrl+A** as prompted to access the ARC Utility.

2. From the ARC menu, select **Array Configuration Utility** (ACU).

3. From the ACU menu, select **Add/Delete Hotspares**.

4. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press **Insert**, then press **Enter**.

5. Select **Yes** when the following prompt is displayed:

"Do you want to create spare?" (Yes/No?)

The spare you have selected will appear in the Select Drive Menu.

Initializing Disk Drives

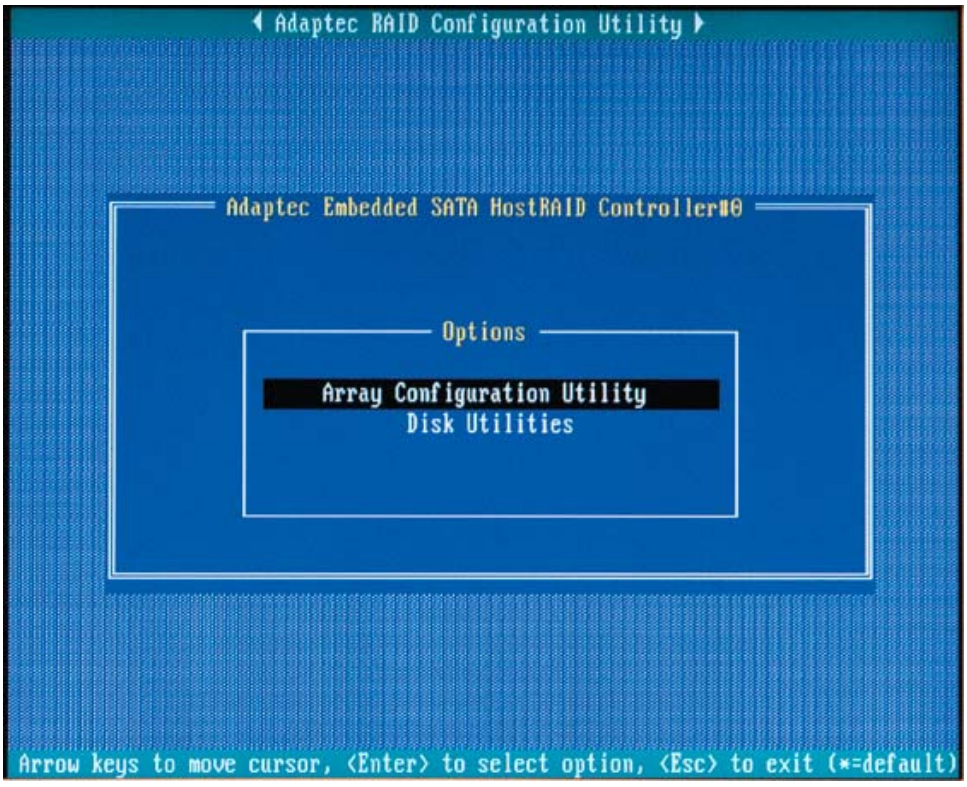
If an installed disk does not appear in the disk selection list for creating a new array or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

Caution: Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.
Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to *Viewing Array Properties.*

To initialize drives:

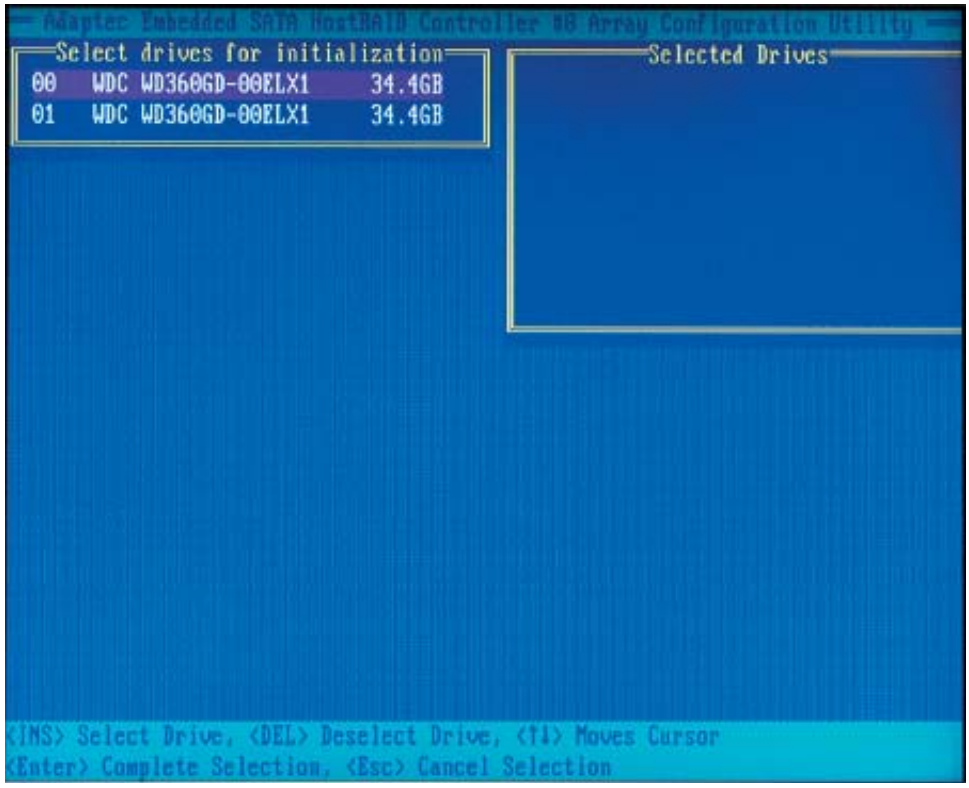
1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Array Configuration Utility (ACU)** (as shown on the screen below).

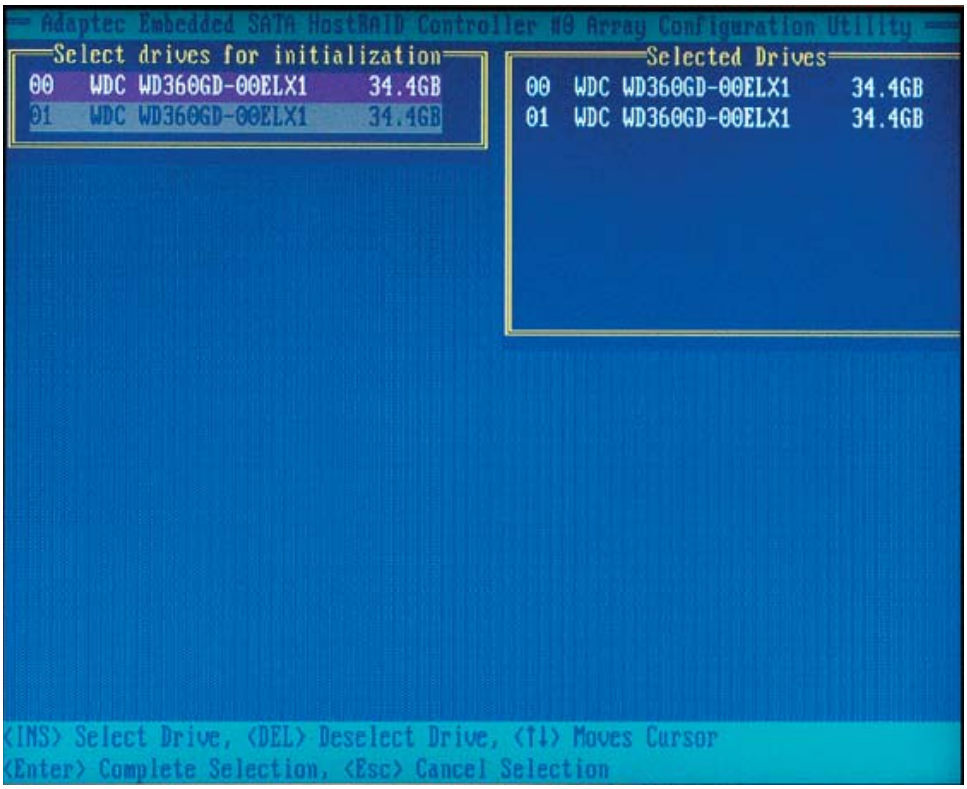

Adaptec RAID Configuration Utility
Adaptec Embedded SATA HostRAID Controller#0
Options
Array Configuration Utility
Disk Utilities
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

3. Select **Initialize Drives**.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press **Insert** (as shown on the following screen).

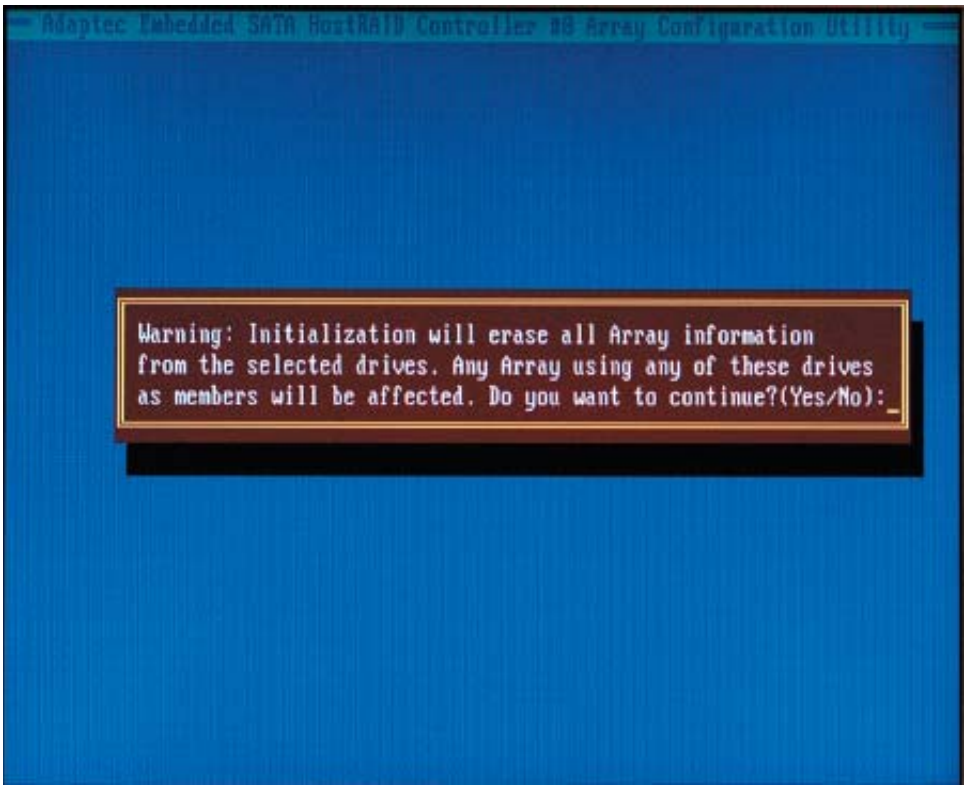

Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Select drives for initialization
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
Selected Drives
<INS> Select Drive, <DEL> Deselect Drive, <↑↓> Moves Cursor
<Enter> Complete Selection, <Esc> Cancel Selection

5. Repeat Step 4 so that both drives to be initialized are selected (as shown on the following screen).


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Select drives for initialization
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
Selected Drives
00 WDC WD360GD-00ELX1 34.4GB
01 WDC WD360GD-00ELX1 34.4GB
<INS> Select Drive, <DEL> Deselect Drive, <↑↓> Moves Cursor
<Enter> Complete Selection, <Esc> Cancel Selection

6. Press **Enter**.

7. Read the warning message as shown on the screen below.


Warning: Initialization will erase all Array information
from the selected drives. Any Array using any of these drives
as members will be affected. Do you want to continue?(Yes/No):_

8. Make sure that you have selected the correct disk drives to initialize. If correct, type **Y** to continue.

Rebuilding Arrays

Note 1: Rebuilding applies to Fault Tolerant arrays (RAID 1) only.

If an array build process (or initialization) is interrupted or critical with one member missing, you must perform a rebuild to optimized its functionality. For a critical array rebuild operation, the optimal drive is the source drive.

Note 2: If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1. From the Main Menu, select **Manage Arrays**. From the list of arrays, select the array you want to rebuild.

2. Press **Ctrl+R** to rebuild.

Using the Disk Utilities

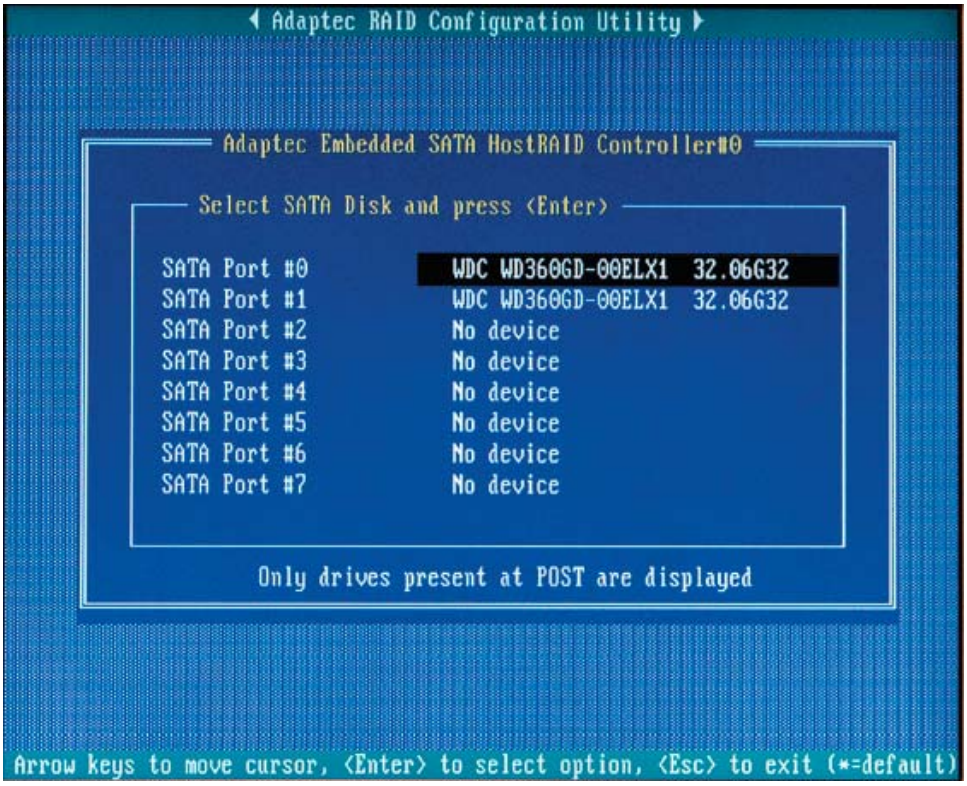
The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press **Ctrl+A** when prompted to access the ARC utility.

2. From the ARC menu, select **Disk Utilities**.

3. Select the desired disk and press **Enter** (as shown below.)


Adaptec RAID Configuration Utility
Adaptec Embedded SATA HostRAID Controller#0
Select SATA Disk and press <Enter>
SATA Port #0 WDC WD360GD-00ELX1 32.06G32
SATA Port #1 WDC WD360GD-00ELX1 32.06G32
SATA Port #2 No device
SATA Port #3 No device
SATA Port #4 No device
SATA Port #5 No device
SATA Port #6 No device
SATA Port #7 No device
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

You can choose from the following options

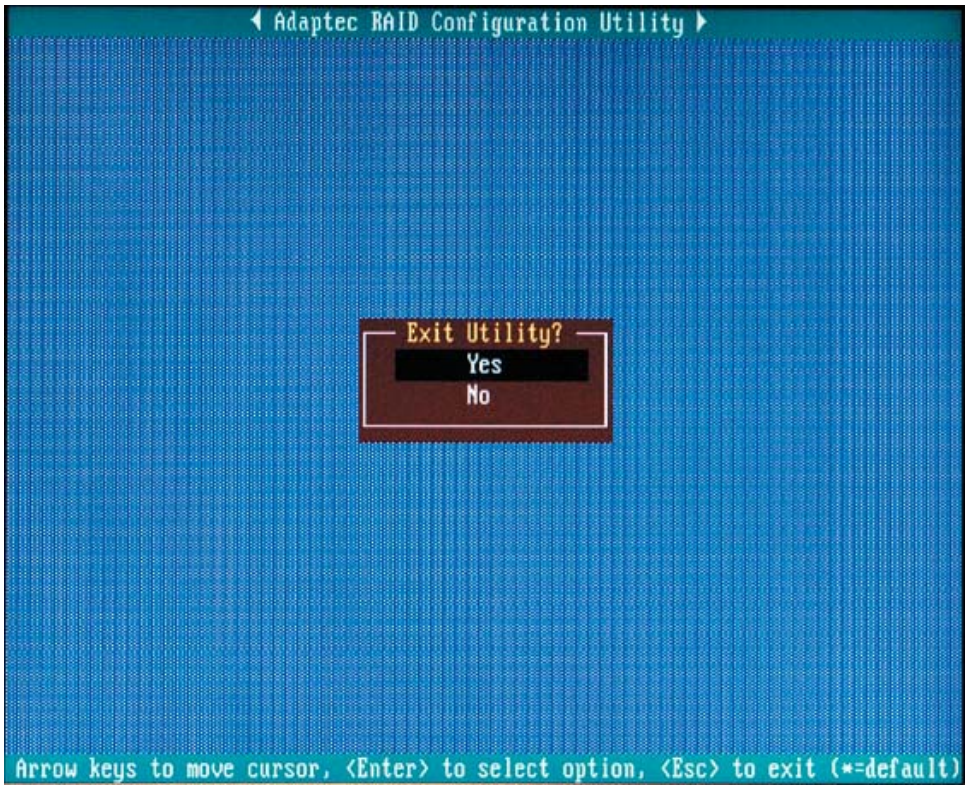
1. Format Disk - Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

Caution: Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.

2. Verify Disk Media - Scans the media of a disk drive for defects.

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press **ESC** to exit. The following screen will appear.



2. Press **Yes** to exit the Utility.

For more information regarding the Adaptec RAID Utility, please refer to Adaptec's User's Guide in the CD included in your shipping package. You can also download a copy of Adaptec User's Guide from our web site at: www. supermicro.com.

B-2 Installing Intel's ICH5R Driver by Adaptec and Windows OS

1. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot. The "Super Micro Driver Diskette Maker" screen will appear.

2. Choose "Intel ICH5R Driver by 3rd Party (Adaptec)" from the items listed and press **Enter**.

3. From the next screen displayed, choose the OS driver you want to install and press **Enter**.

4. Insert a formatted diskette into drive A: and press **Enter** as prompted.

5. Exit the program after the process is completed. Then, reboot the system.

6. Insert Microsoft Windows OS Setup CD in the CD Driver. The system will boot up from the CD.

7. Press the **F6** key when the message "Press F6 if you need to install a third party SATA or RAID driver" is displayed.

8. When the Windows OS Setup screen appears, press **S** to specify additional device(s).

9. Insert the driver diskette labelled "Adaptec Embedded Serial ATA Raid Controller Driver" into your floppy drive and press the **Enter** key.

10. Choose **Adaptec Embedded Host Serial ATA Raid Controller** from the list indicated in the Windows OS Setup Screen and press the **Enter** key.

11. Press the **Enter** key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the **Enter** key to continue with the installation.

12. From the Windows OS Setup screen, press the **Enter** key. The OS setup routine will automatically load all device files and continue the Windows OS installation.

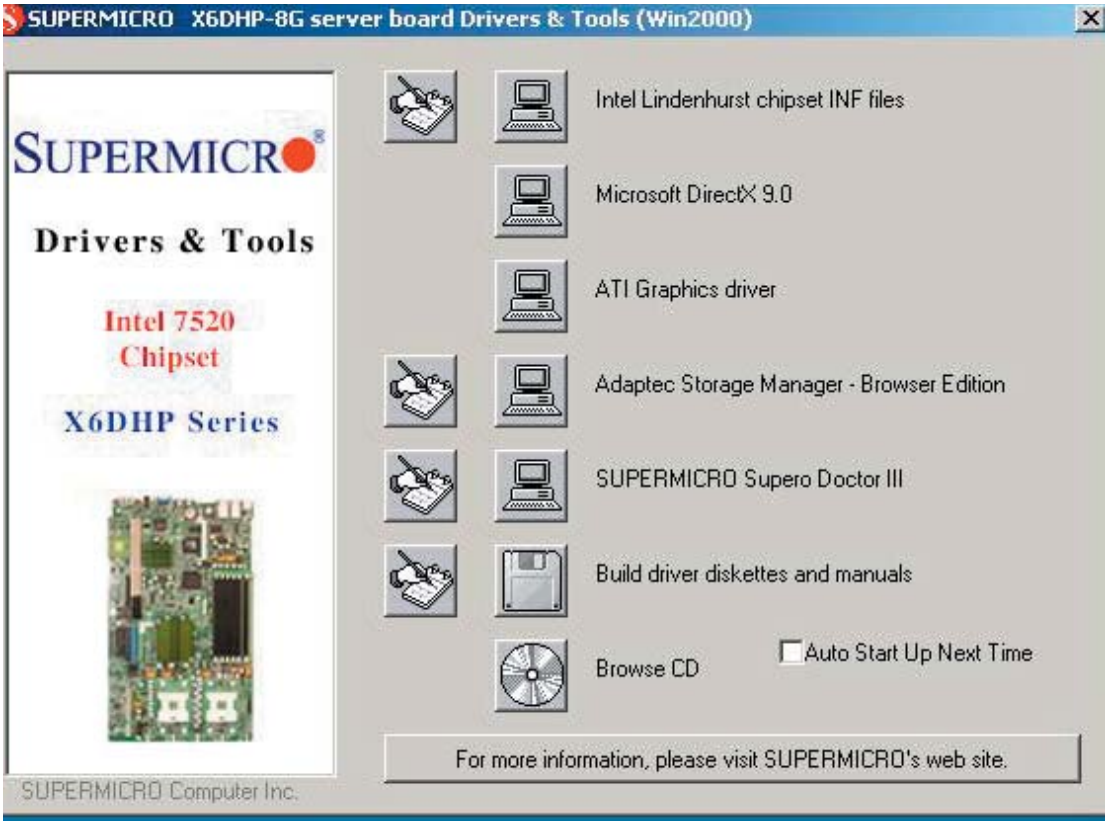
13. After the Windows OS installation has completed, the system will automatically reboot.

B-3 Installing Other Software Programs and Drivers

Installing Other Drivers

After you've installed the Windows Operating System, a screen (as shown in Figure B-1) will appear. You are now ready to install additional software programs and drivers. To install these software programs and drivers, click the icons to the right of these items.

Figure B-1. Driver/Tool Installation Display Screen



Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Note: Please refer to the Adaptec User's Guide (included in the CD) for installing the Adaptec SATA RAID Controller Driver. You can also download a copy of the guide from our website.

Supero Doctor III

The Supero Doctor III program is a web-based management tool that offers both remote and local management tools. The local management application is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See Figures B-2 and B-3 for examples of the Supero Doctor III interface.

Figure B-2. Supero Doctor III: Health Information Display

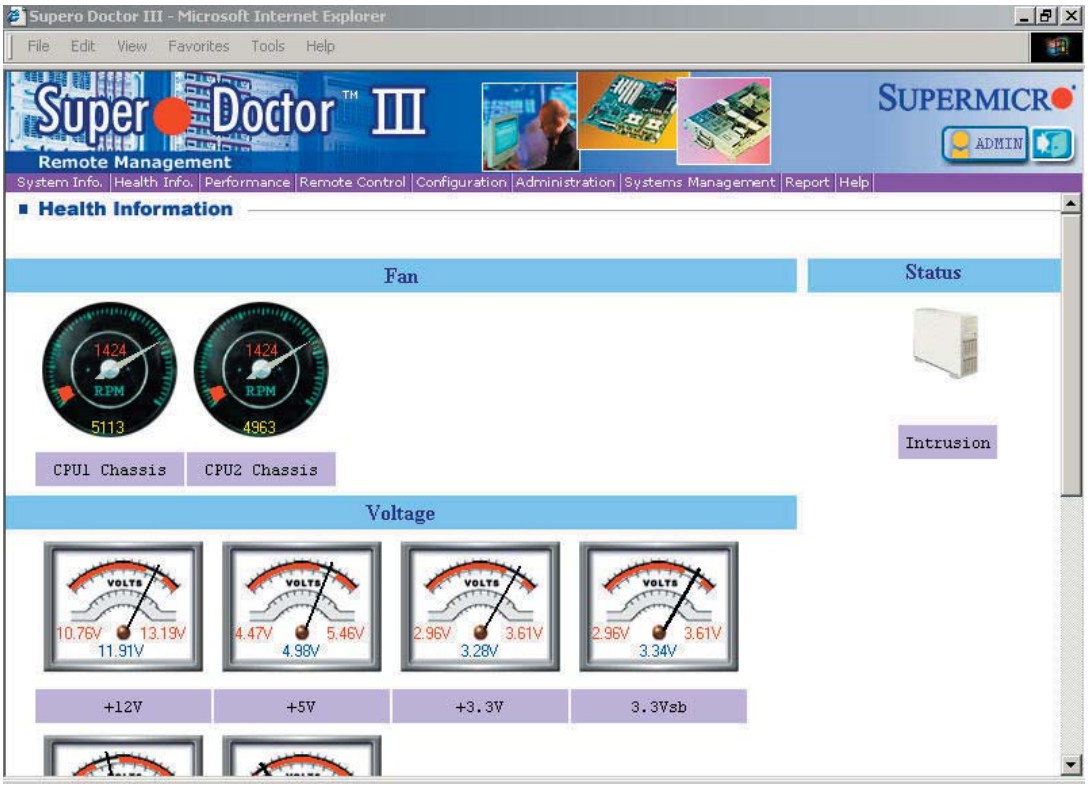


Figure B-3. Supero Doctor III: Remote Control Display

Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we recommend using Supero Doctor II.

Appendix C

System Specifications

Processors

Single or dual 604-pin Intel® Xeon™ EM64T processors at a front side (system) bus speed of 800 MHz.

Note: Please refer to our web site for a complete listing of supported processors: www.supermicro.com

Chipset

Intel E7520 chipset

BIOS

8 Mb Phoenix® Flash ROM

Memory Capacity

Six 184-pin DIMM sockets supporting up to 12/24 GB of registered ECC DDR333/266 SDRAM

Note: Interleaved memory - requires memory to be installed two at a time. See the memory section in Chapter 5 for details.

Serial ATA Controller

- Marvell controller for 4-port Serial ATA (RAID 0,1 and JBOD supported)
- Intel ICH5R on-chip controller for 2-port Serial ATA (RAID 0,1 and JBOD supported)

Serial ATA Drive Bays

Four (4) hot-swap drive bays to house four (4) standard Serial ATA drives

Peripheral Drives/Bays

One (1) slim floppy drive

One (1) slim DVD/CD-ROM drive

Expansion Slots

6014P-T: supports the use of two standard size 100 MHz PCI-X slots or two PCI-Express x8 add-on cards.

6014P-TR: supports the use of one standard size 100 MHz PCI-X or one PCI-Express x8 add-on card.
(See Section 5-6 for details)

Serverboard

Model: X6DHP-TG (Extended ATX)
Dimensions: 9.8" x 16.2" (249 x 412 mm)

Chassis:

6014P-T: SC814+T-560 (1U rackmount)
6014P-TR: SC814+T-R560 (1U rackmount)
Dimensions (both): (HxWxD) 1.7 x 17.2 x 26.7 in. (43 x 437 x 678 mm)

Weight

6014P-T Gross (Bare Bone): 42 lbs. (19.1 kg.)
6014P-TR Gross (Bare Bone): 45 lbs. (20.5 kg.)

System Cooling

Five (5) paired sets of 40-mm counter-rotating cooling fans (fan speed controlled by BIOS setting)

System Input Requirements

AC Input Voltage: 100-240 VAC
Rated Input Current: 10A (115V) to 5A (230V)
Rated Input Frequency: 50-60 Hz

PFC Power Supply (ratings apply to each module)

(SC814+T-R560: two power supply modules, SC814+T-560: one power supply module)
Rated Output Power: 560W (Model# SP562-1R)
Rated Output Voltages: +3.3V (21A), +5V (30A), $12V_{ALL}$ (42A), -12V (1A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-Operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant
UL Listed (USA)
CUL Listed (Canada)
TUV Certified (Germany)
CE Marking (Europe)

Notes